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The purposes of this study were to collect and analyze manpower and production data from 19 countries and to test the relationship between the occupational composition of an industry and the production of that industry. Volume I presents the research methodology, explains the correlations which were used, describes the data and its collection difficulties, and makes an explanation of the occupational and industrial classification systems. A how-to-do-it manual describing the steps necessary to make manpower requirement projections from the given data is included. The appendixes include (1) 26 summary tables giving the occupational composition of industrial sectors for 19 countries, (2) cross indexes for industry titles and occupational titles of the International Manpower Study and the International Standard Industrial Classification, and (3) the authors' standard industrial code used in this study. Data tables from the study are available in Volume II (VT 005 772). (EM)

MANPOWER REQUIREMENTS FOR PLANNING

An International Comparison Approach

Volume I

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PREFACE

The international comparison approach to manpower projections is not new. Over the years standard works on economic development have made reference to the ability of a nation to use the data of economically advanced nations as the target for its production and manpower goals. However, it has generally been noted that the necessary data for international comparisons are not available.

The purpose of this study was to assemble and systematize the necessary statistics from as many nations as possible. Another purpose was to test the hypothesis that there is a relationship between the occupational composition of an industry and the productivity of that industry. This relationship is the rationale for the use of the international comparison approach for manpower projections.

We began this research project in July 1963. Our principal efforts were to obtain detailed statistics on the occupational composition of the labor force, cross-classified by industry, from as many nations as possible. Because of significant variations in occupational and industry titles among the various nations, we had to develop our own occupational and industry classification systems. The former system contains 225 occupations and occupational groups under which we subsumed all the occupational titles used by the nations in our survey; the latter contains 58 industries and industry groups under which we subsumed all industry titles used by these countries. We were able to collect the detailed data from 19 different countries, seven of which furnished us with statistics for two different dates. In addition, we obtained various economic data from these nations as well as data on educational attainment by occupations and occupational groups.

We are convinced that the international comparison approach to manpower projections is the most useful for developing nations. The correlations that we ran indicate that there is a relationship between the occupational composition of an industry and the level of productivity in that industry. We believe that the data presented in the report provides to nations who are engaged in manpower planning the basis for making projections of manpower requirements.

In Volume I we present an analysis of our approach and an explanation of the correlations which show the relationship between the occupational composition of an industry and the productivity of that industry. We describe the statistics collected and difficulties we faced in obtaining all the data. We explain how our occupational and industrial classification systems were derived, and how they differ from the International Standard Classification of Occupations (ISCO) and the International Standard Industrial Classification (ISIC). We also present a how-to-do-it manual, which describes the steps that must be taken to use our data for projecting manpower requirements. Included, of course, are the usual caveats about the casual use of our statistics and of the international comparison approach.

Volume II contains all the basic statistical tables. There are three sets of tables: the first set contains 26 country tables showing the occupational composition of the workforce in up to 58 industries or industry groups in each country; the second set contains 52 industry tables showing the occupational composition of each industry in the countries in our survey, ranked by productivity; and the third set shows the relationship between the occupational structure of the workforce and the level of educational attainment for 16 countries.

In a study such as this the authors become indebted to numerous persons -- more than can be legitimately listed in this preface. We corresponded with more than one hundred persons in numerous countries around the world. All were helpful in one way or another. Some sent us the requested data; others gave us leads as to where or when the data could be found. We visited nearly a hundred additional persons in various countries, and again we found all very helpful, in some way or other. To all these individuals and their organizations, we extend our thanks. Collectively, all these people made this report possible.

Special acknowledgement of indebtedness or assistance must be made to a select number of individuals. First, we must acknowledge the aid given us by Mr. Everett Reimer, until September 1964, Social Development Advisor, Alliance for Progress, AID, and currently with the Department of Education, Commonwealth of Puerto Rico. It was Mr. Reimer who helped us formulate the project in the spring of 1963 and who assisted us in obtaining the necessary funds from the Bureau for Latin America, AID, that made this research possible. In addition, his ideas and suggestions helped us immeasurably.

We are also indebted to Mr. Joshua Levine, Regional Manpower Consultant, Bureau for Latin America, AID. His confidence in us and our project has permitted us to continue and expand our research. In addition, he gave us valuable advice on numerous substantive issues.

We also wish to acknowledge the assistance of Mr. Robert M. O'Brien, Assistant Director of the Computer Center at Northeastern University and his assistant, Michael Allen. A number of graduate and undergraduate students worked with us at various times during the research, and to them we extend our thanks. At the early stages of this project we had the able secretarial services of Mrs. Rosemary Trask and Mrs. Victoria Peterson. To them we express our appreciation. At the final stages of the project, when we were going through numerous drafts of tables and manuscript, we had the able secretarial services of Miss Betsy Jones and Miss Clare Scherer, We express our special appreciation to them for their help and especially for being able to read our handwritings and for maintaining their composure while working for the three authors under the pressures of a tight schedule.

We alone bear all responsibility for the completed study -- both its good and bad points -- and for the views and judgments expressed.

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I. INTRODUCTION

Rapid economic growth is one of the key goals of most developing nations of the world. To aid in these efforts, economic consultants and development specialists have been peddling their nostrums for approximately two decades. Few of these nations, however, have managed to attain their development goals, despite their efforts and the advice and assistance of outsiders. We have yet to find the solution to the basic problem of attaining a relatively high level of development and industrialization in a short period of time.

Economic development for almost all developing nations involves a sharp break with the past. Certain trends may continue in some sectors of the economy, but the major thrust of industrialization involves a new direction in the forward movement of various economic sectors. Developing nations generally find little in their past economic development that can help them plan rapid industrial growth. And even where the past trend could guide plans for the future, few developing nations would have sufficient usable statistics to compute an accurate trend.

Despite these problems, developing nations realize that some planning must take place if they are to be at all successful in increasing their rate of industrialization. General economic plans are being produced, developed, adjusted, and readjusted in most nations concerned with rapid growth and industrialization. The more realistic plans take into account manpower as an important factor for economic development. But too few economic planners consider human resources a major factor in the planning process. Only in recent years has more emphasis been placed on manpower, but knowledge of this factor is still limited. To some economic planners manpower is an institutional factor which does not quite fit into a mathematical economic model of an expanding economy.

In our judgment, human resources is a key factor in the economic development of a nation, and therefore must be integrated with any general economic plan. Capital, physical resources and technique may be purchased or borrowed from abroad, but for numerous economic, social and political reasons a nation must use its own manpower to build and run the plants and facilities of its economy. When plans are made for the expansion and growth of specific economic sectors, plans must also be made for the manpower that will be required by these sectors. It thus becomes important to estimate future manpower requirements within the framework of a general economic plan because of the direct and close relationship between the projected output of an industry and the manpower required to produce that output. This cannot be done when no relevant past statistics exist to determine a trend; or when a sharp break with the past is projected for the future; or when the industry itself has not existed. Alternatives must be found.

When an industry or an economic sector already exists, one such alternative is to project future manpower requirements of an industry or sector from the occupational structure of its most modern plants. India, for example, has used this procedure in its plans for development of some industries. For many other industries, however, this procedure apparently has not been considered appropriate, and has not been used. Other nations have undoubtedly used this approach in estimating future manpower requirements for expanding sectors of their economies.

Another alternative open to all developing nations, as well as to fully developed nations, is to use as guides the relevant manpower statistics from other countries. The nations of the world have attained various levels of development, and the experience of one country may be of assistance to others. The past attainment of one country may approximate the goal of a less-developed country. If the right kind of data were available for each nation of the world, a developing country could select from the array of these statistics those figures most applicable to its economic goal of five, ten, or fifteen years hence. Since manpower projections must be made for both demand and supply, the statistics needed for comparison have to cover both aspects of the future labor market.

This approach of using another country's attainment as a target was adopted by the planning and developing agencies of Puerto Rico in its "operations bootstrap." Puerto Rico assumed that the major sectors of its economy in 1975 would approximate the productivity levels of the United States in 1950, with the distribution of employment following a similar pattern. Perhaps data from other nations would have been more appropriate, but there was no real choice; no statistics other than those for the United States were in any way reasonably comparable and readily available. Despite the disparate levels of economic development between Puerto Rican industries and the industries of the United States, the comparisons were used and with considerable success.

There are few experts or writers in the field of manpower and human resources development who do not recognize international comparisons as a basic method of making manpower projections. This method of making projections has had limited use because the relevant data have not been collected, analyzed, and made available in useful form to the developing nations of the world. Inevitably, mention of the international comparison method of manpower projections as a valuable approach is footnoted with the caveat that the necessary data are not available.

The goal of our research project was to make available to developing nations the relevant manpower statistics of various industries for selected countries which are at different levels of economic development. The past attainment of one country might approximate the goal of a less developed country. From such an array of data, a developing nation could select one set of manpower statistics as its target for some future level of development. Or, put differently, a developing nation could select the level of development of an industry in another country as its goal and then use the occupational distribution of that industry in the other country as the basis for its manpower requirements. The greater the number of nations represented in our continuum from high to low level of economic development, the greater the likelihood that a developing nation could find the set of statistics that most closely matches its target of future development. It would be possible, of course, for a nation to interpolate between sets of data, but steps between relevant sets of statistics would have to be kept as narrow as possible in order to minimize errors.

The first step in our research scheme was to examine the literature on various economic and manpower factors for a number of preselected countries. This involved researching the various libraries in the area, as well as those in the United Nations in New York and the Pan American Union in Washington, D. C. At the United Nations we examined the census questionnaires and the interviewer instructions for numerous countries, and in some cases we were able to obtain a country's planned time schedule for the completion of the various parts of its census report. From the United States Bureau of Census, the United Nations and elsewhere, we were able to obtain the names and address of persons and agencies in various countries that might have the data we sought. In addition, we also canvassed the American Labor Attaches and the U.S. AID mission offices in various nations around the world.

From this early source material it became clear that some of the data that we considered important would not be readily available from some of our preselected nations. We therefore widened our scope, in order to obtain detailed data from a sufficient number of diverse countries to make our study meaningful.

II. THE WORKING HYPOTHESIS

Basic to any economic plan is the planning of production for the various sectors of the economy. Manpower planning is needed to complement the planning of production, and the link between the two types of planning is the relationship between the occupational composition of the labor force in a given industry and the productivity of that industry. The following hypothesis was developed to test this relationship:

> Since a given occupational composition reflects a given state of technology, (and hence productivity) there is a relationship between value added per employed person in a given industry and the occupational composition[1] of the workforce in the same industry.

The term "technology" is used in its broadest context, and reflects a variety of factors such as type of equipment, size of establishment, size of market, product mix and quality, degree of process integration, work practices, and the availability of ancillary services.

For the international comparison method of manpower projections to be more than hazardous guesswork, it was necessary to test the validity

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1. Bear in mind that when we refer to occupations we mean functions. We are not evaluating the general capacity or the alternative abilities of the individual who happens to be performing a particular function. In other words, when we say that industry A requires a certain percentage of electricians to achieve a specified level of productivity, we assume that workers assigned the tasks and duties associated with the job description of electrician are in fact reasonably competent electricians and are working as electricians. In effect, we classify a worker according to his duties, as reported by him, and not according to anything else he can do. If a lawyer, for example, is working as a foreman and so reports himself, we consider him a foreman and not a lawyer.

of the hypothesis. Only if there is a relatively unique relationship between the productivity level of an industry and the occupational composition of that industry can developing nations use this method of manpower projections with some feeling of reliability. While the crucial test was made after all the data were collected from the various countries in our sample,[2] a pre-test using United States data was made at the initial stage of the project. This early pre-test gave us an indication of the relationship we could expect from international statistics.

The United States Census of Population provides occupational data by industry for every state, while the United States Census of Manufacturers and the Annual Survey of Manufacturers provide pertinent data on value added per employee and number of employees by industry. We used 1960 data, and we chose State data because of their comparability and the adequacy of the number of observations. We then tested whether State differences in the value added per employee of an industry were related to State differences in the occupational composition of that industry. The occupational composition consisted of 19 occupations and occupational groups, selected on the basis of distinctive job functions. For example, in the professional and technical category, we separated accountants, engineers, scientists and technicians. In the manual worker category, we separated operators and craftsmen; in the craftsmen category, mechanics, electricians, foremen. The percentage distribution of these 19 occupations or groups in the workforce of each industry in each state constituted the occupational composition of each industry by state. A multiple correlation across states for each industry between value added per employee and occupational composition gave the coefficients presented in the following Table 1.

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[2] The correlations using our international statistics to test this hypothesis is discussed in detail below.

Table 1

Correlation Between Productivity and Occupational Distribution in Selected Industries in the United States - 1960[3]

Industry	(1) R^2	(2) R^2
Fabricated Metals	.586	.672
Food and Beverages	.768	.601
Chemicals	.623	.883
Machinery, exc. Electrical	.649	.672
Electrical Machinery	.549	.482
Apparel and other Fabricated Textiles	.614	.688
Printing and Publishing	.569	.617
Textiles	.472	.730
Rubber and Plastics	.458	.651

These correlations show a relationship between value added per worker and the occupational mix of a given industry. However, it must be stressed that the nature of the relationship is not the same for each industry.[4] Each industry seems to have its own pattern of occupational change as productivity changes, and it is impossible to generalize from one industry to another. These results were, of course, based on the relationships in one country -- the United States -- where there are relatively few problems of data comparability. Nevertheless, the U.S. results provided us with an indication that similar relationships were likely to exist internationally. However, the testing of the hypothesis using international manpower statistics required the prior collection of manpower and economic statistics from a series of nations.

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[3] All coefficients of correlation are significant at the 5 percent level. The coefficients of column (1) were obtained from a linear correlation of the type $y = a + a_1 x_1 + a_2 x_2 + \dots a_{19} x_{19}$, where y is value added per employee, x_1 is the percentage of occupation 1 in the total work force, x_2 the percentage of occupation 2, and so on.
The coefficients of column (2) were obtained from a linear correlation of the type $\log y = a + a_1 \log a_1 + a_2 \log x_2 + \dots + a_{19} \log x_1$, where y, x_1, x_2 and so on are the same as in the first equation.

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4. The particular type of relationship is defined by the correlation equation of the industry involved.

III. THE STATISTICS

Collecting the Data

The manpower data needed to test our hypothesis and to make available to developing nations a choice of occupational structures included a detailed cross-classification of occupations by industries. This was the minimum amount of data needed from each country to be included in our sample. To supplement this manpower data, we sought statistics on levels of educational attainment cross-classified by occupation. In addition, we were interested in collecting various economic data in order to develop a measure of industrial productivity free of the distortions due to currency exchange rates or due to tax and subsidy policies. We were also interested in collecting statistics on other factors that could influence productivity, such as size of establishment and concentration of industry.

If available at all in a country, the key set of manpower statistics would be available through a general population census. Since most countries conducted a decennial population census in either 1960, or 1961, we assumed that the data would be readily available for many countries by mid-1963, when we began our research project. After considerable international correspondence we discovered that few nations had completed the tabulation of their 1960 or 1961 census by early 1964. But even where the tabulations were completed or near completion, we found that the printing of the final volumes would add at least another year before the statistics would be available for general distribution. Efforts then had to be made to obtain sets of various statistical tables before publication.

In addition to a constant flow of correspondence to nations around the world, requesting specific statistical information, we visited many countries to make personal requests for data. In some countries, such as England and France, we were able to purchase typed copies of statistical tables before they were sent to the printers. In other countries we were able to purchase computer print-out tabulations, and thus avoid long delays in the typing of tables or in the printing of the statistics. In some cases, such as in the Netherlands, Argentina and Israel, we contracted with governments for special tabulations because they had not planned to run the cross-tabulations we needed. We helped finance the machine tabulation of manpower data in one country in order to hasten the processing of the statistics. Some countries sent us specially prepared hand-tabulated pen-and-ink tables. In one case we purchased a microfilmed set of unpublished statistics. For a number of countries, expecially those with data from a 1950 or 1951 census, we had nothing more to do but purchase, or obtain free, copies of the published census reports. We finally collected detailed manpower statistics from 19 countries for seven of which we have data for two dates. We thus refer to 26 "country" tables of manpower statistics.

Statistics on educational attainment cross-classified by detailed occupations were not available in all the countries that had adequate occupational and industrial data. A number of nations had not considered significant the cross-tabulation of education and occupation, and therefore, had so posted their data that it was impossible to prepare such tables for us. Much of the economic statistics that we collected were not found among the data of population censuses but were part of regular or special industrial censuses or surveys. Some such surveys were readily available; others were exceedingly difficult to obtain.

The large volume of statistics and data collected from so many countries and sources made it essential to put the information on computer punch cards. Only by using a computer could we store and process the information collected. Significant adjustments had to be made in the raw data to make them comparable enough for international comparisons. The occupational classifications presented the most serious problems of comparability.

Problems of Occupational Classification

At a minimum, international occupational data ought to permit interindustry and intercountry comparisons of key occupations, either because they represent skills crucial for development or skills intimately linked to technological change. Occupational data thus have to be in sufficient detail to show well defined jobs which can then be combined into groups of closely related jobs on the same level of skill and requiring the same types and amounts of education and training. Furthermore, for purposes of international comparison, job groupings in different countries ought to include the same types of work. However, such comparability is more than a matter of job title; it also involves job content.

Population censuses are the source of most of the currently available occupational data. To varying degrees, all census data seem more concerned with reporting traditional job titles, regardless of their significance to the economy, than with reporting jobs essential for growth, or with determining whether the title fits the content of the job. For example, at least one major European country seems more interested in knowing how many barkeeps it has than in knowing how many technicians of various types it has. Its technicians are grouped under one all-inclusive label, irrespective of what they actually do.

For the research, international occupational data present three interrelated problems, aside from the question of accuracy, which we assume solved for this discussion. The first problem, and conceptually the least serious of the three, is excessive aggregation, compounded by a failure to use similar groupings of data. Dissimilar groupings reflect in part differences in the degree in aggregation and in part, different combinations at the same level of aggregation. No country reports data in as great detail as that provided by the five-digit occupational titles of the International Standard Classification of Occupations (ISCO).[5] Most countries use either the three-digit unit groups of ISCO, its two-digit minor groups, or some variation of one or the other. An example of a five-digit ISCO occupation would be "Machine-Tool Setter, Metal Working," part of the three-digit unit group, "Fitter-Machinists, Toolmakers and Machine-Tool Setters," which in turn is part of the two-digit minor group, "Toolmakers, Machinists, Plumbers, Welders, Platers and Related Workers."[6]

Any aggregation above the three-digit level is relatively useless if one is interested in precise occupational comparisons. Unfortunately, once the data has been combined in dissimilar ways, it is impossible to make valid international comparisons unless one can decompose the figures, a

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5. International Labour Office, International Standard Classification of Occupations (Geneva, 1958). However, New Zealand made available to us occupational data in considerably greater detail than this.

6. Ibid., pp. 113-114.

procedure precluded by the failure to publish occupational data in finer detail.

Aggregation presents another problem as well. It conceals what might be vital jobs in an occupational structure, by submerging them in a broad grouping. Broad groupings are particularly deceptive if they contain offsetting trends. Our own work with United States occupational data by industries and states suggest, for example, that certain specific occupations such as accountancy or mechanical engineering might be more important in distinguishing different sectors of an industry than a more inclusive group, such as one containing all professionals. Moreover, it makes a great deal of difference for educational planning whether it is necessary to provide physical plant and facilities to educate accountants or to educate engineers, and within the latter group, whether to educate electrical engineers or industrial engineers. The more advanced the occupational level, the greater the likelihood of specialization and the greater the difficulty of moving to another professional specialty even within the same profession.

The second and by far the more serious problem is the proclivity for classifying occupations by product or by process rather than by level of skill or by degree of work complexity. In part, but only in part, this preference reflects the use of socio-economic categories rather than those based on technological considerations. But is also reflects the absence of a universal system for determining the complexity or skill of a job. ISCO, for example, often groups together blue-collar workers engaged in the same activity or industry, regardless of skill level. This problem is prevalent on the three-digit level, but even the five-digit level of reporting is not immune. For example, ISCO has a five-digit occupation, "Electrical Fitter (Domestic Appliances)," who:

> Fits, assembles and repairs electrical domestic appliances in factory; performs basic tasks similar to those of Electrical Fitters, General ... but works on electrical domestic appliances, such as electric fans, vacuum cleaners and irons, of which special knowledge is required.[7]

Is this an all-around craftsman, a skilled fitter-assembler or merely a semiskilled assembler? He may do all the tasks specified, but the likelihood is that he specializes in just one or two at most. Such a definition, in short, gives the coder too much discretion, particularly since ISCO provides only a residual classification as an alternative.

The merging together of different skill levels makes it almost impossible to isolate occupations that probably are crucial for economic development. Skilled manual workers and first line supervisors too easily disappear in an abyss entitled, variously, "craftsmen and production workers" or in a classification based upon industry, as for example, "chemical and related process workers." It would seem essential to separate skilled production workers from semiskilled machine tenders or process workers. Similarly, unskilled workers or learners ought not be included with skilled and semiskilled workers. Typically only unskilled laborers appear by themselves, even though lack of skill is not only or even primarily a matter of whether or not the work requires brawn rather than brains.

The neglect of skill differences is not restricted to blue-collar workers. It is almost endemic among white-collar and service worker categories, which bear the burden of somewhat archaic social distinctions rather than more useful functional distinctions. All censuses as well as ISCO

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7. Ibid., p. 126.

treat managerial and administrative personnel alike, as if the corporation president, the plant manager, and the department foreman performed work at the same level of difficulty and required the same amount of training and experience. In some censuses the working proprietor is segregated, but this is a relatively rare concession.

Luckily, a somewhat better job of distinguishing skill levels occurs in the classification of clerical and sales workers because many job titles coincide with differences in the degree of work complexity or the amount of skill required. But even in this case there are disturbing lapses. Very often there is one all-inclusive category for office machine operators or for all sorts of specialized clerks. Unfortunately, machine operators and specialized clerks include a fairly broad range of skill levels, the majority of a nation's clerical workers, and, frequently, rapidly growing occupations. Sales clerks who may not be much more than package wrappers and money collectors are indiscriminately dumped with sales people who have to persuade customers to buy expensive consumer durables.

Finally no census tries to differentiate service jobs by degree of complexity, except in a very rough, accidental fashion. Thus, service workers often are classified into those working in households and those working outside. The inference is that the former are at the bottom of the skill scale. ISCO has a fairly elaborate classification of service workers, but it is necessary to get to the five-digit level before skill differences can be distinguished. Even here, however, there are difficulties. First, skill differentiations are largely fortuitous, the result of conventional ways of labeling and grouping jobs rather than systematic efforts to rank them by complexity. Secondly, even the rough skill differentiations discernible at the five-digit level have ambiguities.

A few examples are in order. How does a cook compare in terms of skill with a policeman, or a beautician with an airline stewardess? The difficulty is compounded when one tries to make comparisons among major groups. Is a keypunch operator or a telephone operator the equivalent of a stewardess? And how do all three compare with a rolling mill operator or a carpenter? There are no guidelines here. It is assumed, more or less, that the clerical worker and the service worker, excepting the drudge, needs more formal schooling than the blue-collar worker, and that therefore the former is "above" the latter in some way.

Our third problem involves job content. Census occupational data are gathered without trying to learn anything about the content of the jobs reported. Only job content can offer clues about the degree of complexity of the work and the degree of skill needed to perform it. For example, what is a cook? Is he a chef or an exalted counter clerk? Is a machinist an all-around craftsman, job setter or the operator of a specialized machine tool, possibly completely automatic? Questions of content are especially important when comparing the occupational structures of industries at different levels of mechanization. Job titles by themselves can confuse the difference between modern machine skills and traditional artisan skills. The more technically advanced an enterprise or industry, the greater the likelihood of specialization and the greater the likelihood that work will not require traditional skills, even though the traditional titles continue to be used. Thus, a low productivity textile industry might have a high proportion of skilled weavers, while a high productivity textile industry might have comparatively fewer weavers, most of whom actually are semiskilled machine tenders. One could multiply such examples, not only with respect to manual worker jobs but also with respect to white-collar and service ones as well, as our earlier discussion suggests.

The occupational code we developed for our work[8] reflects many of the dilemmas noted above. We chose ISCO as our frame of reference on the grounds that other nations were more likely to use it, or a modified version of it, than they were to use the census categories of the United States. We first tried to rearrange ISCO's five-digit occupations according to broad skill categories, such as skilled, semiskilled and unskilled for manual worker occupations, and higher-skilled and lesser-skilled for white-collar workers and service occupations. However, the failure of ISCO to delineate blue-collar skill levels or to account separately for supervisors, and the failure of most census data to do the same or to report occupational data in sufficient detail, forced us to abandon our original effort. We finally adopted a classification system of 225 occupations or occupational groups based upon occupational titles reported by individual censuses rather than one based upon skill requirements.

Our original classification scheme had also sought to distinguish between blue-collar and service occupations that cut across industry lines (e.g., mechanic, driver) and those peculiar to an industry (e.g., tire builder, weaver). The objective was to minimize the number of classifications as well as to identify occupations that might affect multiple industries, perhaps the entire economy. Our revised classification retains this distinction to the extent that existing census classifications do. Here again, however, job titles or names, rather than skill level or work content, are the basis for classifying and reporting data.

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[8] Northeastern University, Classification of Occupations by Skill Level, 1964, unpublished, multilith.

Problems of Industry Classification

Inasmuch as all of our occupational data were to be cross-classified by industry we had to devise an industrial classification system that was applicable to as many of the countries in the study as possible. In addition, our classification scheme had to distinguish industries crucial to development. In contrast to our difficulties developing uniform occupational classifications, differences in industry content posed comparatively few problems.

The first step was an examination of the census classifications of a number of countries in our sample, to determine how they actually grouped industries. The United Nation's International Standard Industrial Classification of all Economic Activities (ISIC), containing 134 detailed industries, became the basis of our classification system because the industry codes of most countries were very similar to ISIC. Although many nations used very detailed industry breakdowns in their statistics of employment by industry, they did not always use the same industry detail in their statistics of occupational composition. As a result we had to adjust various industry groupings to accord with those actually used by individual countries. Thus, some ISIC industries were combined, and divisions of others rearranged. The combinations allowed us to accommodate industry codes of varying degrees of detail. For example, most countries provided detailed occupational data for both "Agriculture" and "Forestry and Logging";

but a few countries combined the two and provided statistics for only "Agriculture, Forestry and Logging". Consequently, our classification scheme includes not only "Agriculture" and "Forestry and Logging," but also the combination of the two industries. The same arrangement was used with a few other industries, and here also our classification scheme includes both the individual industries and the combination of the two. Nevertheless, our industry classification scheme of 58 industry or industry groups varies in only minor ways from the two-digit categories of ISIC.

Problems of an Education Classification

Our view that the occupational composition of an industry's work force is a key determinant of an industry's productivity, and that a detailed classification of occupations is needed for efficient manpower planning, differs in some ways from the view that the educational level of a nation's population is a major determinant of productivity. It is not the educational level, but the skills of a nation's work force, that are most significant, and the two are not necessarily synonomous. In addition there are sufficient differences in the educational levels and the productivity levels of various industries so that nationwide figures become rather meaningless for planning purposes.

A great deal of attention has been paid and continues to be paid to the education for professional and technical occupations. One possible reason is that the gestation period of these occupations is long and that the way to become a professional is well defined and singular. Until recently educators and economists have paid much less attention to skilled manual workers, despite their numbers and the importance of their role in production. Nonetheless, the training of a craftsman may require years of formal schooling and then more years of on-the-job training and work experience. The way to become a skilled worker, however, is less clearly defined than the way to become a professional. Training may be substituted for schooling and vice versa, and skills appropriate to one occupation may be transferable in varying degrees to other occupations. Thus, there are multiple paths of skill acquisition, all leading to the same objective -- the turning out of a person who can meet the work requirements of an occupation.

When a country cross-tabulates occupations with educational data, it is always in the framework of formal education in the regular school system. Informal schooling and on-the-job training is not considered part of the educational structure and thus is not included in the data.

Even when only formal schooling is included, however, inter-country comparisons are not easy to make. The school systems of the nations covered in our study differ in structure and use different terminology.[9] Fortunately, publications of the United Nations describe the educational systems and structures of various nations,[10] and make it possible to take account of such differences when making comparisons.

The chief obstacle in making international comparisons of educational data is that countries either group data differently or collect different information. In Canada, for example, years of schooling are grouped as follows: 0-4, 5-8, 9-12 and 13 years or more. In the United States, years of schooling are combined somewhat differently: 0-4, 5-7, 8, 9-11, 12, 13-15, 16 and 17 years or more. Other countries use still different intervals, and it is not always possible to establish uniform intervals because of overlapping.

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[9] Differences in quality obviously exist, but they could not be pursued here.

[10] See UNESCO, World Survey of Education - II, Paris, 1958.

A more serious problem is the use of methods other than years of schooling to present educational attainment. Some nations use the highest level of school completed; a few the age at which formal education is completed. It is almost impossible to translate these two classification systems into years of schooling completed. The number of years of various school levels differs among countries; moreover, there is no way of knowing how many years were spent by members of the population at uncompleted levels. Finally, age of completion is not necessarily the same as level or years of schooling completed because of variations in age of entry, rate of promotion, and the number of years of different school levels.

If education is at all significant for the planning of manpower, it is not the average level of education attained that is important; what is important is the minimum level of education needed before a person can learn to perform effectively the duties of an occupation. Developing nations with limited resources have to be especially careful to choose the most efficient and economical ways of imparting scarce skills. We had no way of determining the minimum level of education required of each occupation.

Because of the differences in classification methods and the uncertain meaning of reported amounts of education, we decided against developing a uniform classification system for educational attainment. Instead, our educational data by occupation are presented by the educational categories of the original data.

Problems of the Productivity Statistics

The ambiguities of inter-country comparisons of productivity have not been fully solved in economics. Despite numberous efforts to do so, progress has been slow and practical measures of comparison few. International differences in exchange rates, taxation and subsidy policies, wage levels, product mix, markets, depreciation policies, etc., seriously hamper the task of comparing productivities of industries in different countries.

Nevertheless, various criteria can be used to determine the relative productivity of an industry in one country vis a vis the same industry in another country. Where some physical measure of direct output is available, such as tons of coal mined, passenger-miles transported, or tons of iron produced, the task of comparison is rather simple. However, where no such direct measure is available, we must turn to less satisfactory measures. The alternatives may be some measure of output value per employee or some indirect measure of productivity, such as power consumed per worker. However, a physical measure of output is not applicable to most manufacturing industries. For these industries, therefore, we used the productivity measure of value added per worker in the local currency multiplied by an exchange rate, quoted in dollars, to express the result in dollars per worker. Where different exchange rates existed, we used the free market rate.[11]

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[11] This rate should be adjusted by a coefficient reflecting import tariffs, in the case of local industries that compete with foreign imports, or export taxes in the case of export industries. This would give a better approximation of the actual productivity. Only an exhaustive study of import and export regulations of each country can provide such information. The need for such adjustments can be seen in the case of Chile. Total production in mining in local currency multiplied even by the overrated official exchange rate, 60 percent higher than the free rate, still gives a figure much lower than the one obtained by multiplying the amount of physical productivity by international prices in dollars. The reverse happens with some sectors in manufacturing, where tariffs can be as high as 200 percent, or more.

We used this value added measure in dollars for most of the industries in our final table.

Productivity figures in local currency were generally derived from industrial censuses for the manufacturing sectors and from statistical yearbooks for other sectors. In some cases, such as for Finland, Yugoslavia, and Argentina, figures were specially supplied by the respective countries. Employment figures used to calculate value of output per worker were obtained from the same sources as production figures, and not from population censuses. In most cases, production figures reflect only those of establishments with five or more workers. In such cases, we assumed that the productivity of establishments with fewer than five workers was equal to the average productivity of the rest of the industry. Generally, in the manufacturing industries, the smaller establishments excluded from industrial censuses do not represent a relatively large part of industry output or employment.

All productivity data were adjusted by the average number of hours worked. Where data were available, the number of hours of the specific industry was applied; in other cases, an average for the broader sector, such as manufacturing, was used. This adjustment by hours is quite important since in some cases it meant a difference of as much as 20 percent in worker productivity. Where we had statistics for two years for the same country, such as for 1950 and 1960, the 1950 figures were adjusted by a price index, before applying the 1960 exchange rate.

Where figures in physical or value terms were not available, kilowatt hours per worker, horsepower per worker, or both, were used as a guide for placing the industry between two industries with known productivity data. In those few cases where data were not available for any of our productivity indicators, the occupational structure of the industry served as the basis for locating the industry between two known points of reference.

The following is a list of the productivity indicators used to rank the industries of the different countries in the industry tables found in Volume II.

TABLE 2. INDUSTRY PRODUCTIVITY INDICATORS

INDUSTRY	PRODUCTIVITY INDICATOR
001. Agriculture, Forestry & Fishing	Value added/worker
002. Agriculture	Value added/worker
003. Forestry and Logging	Square foot of lumber/worker
004. Fishing	Tons of fish caught/worker
005. Mining & Quarrying	Value added/worker
006. Coal	Tons of coal plus adjusted tons of lignite/wkr
007. Metal	Tons of iron ore/worker
008. Petroleum and Natural Gas	Tons of oil/worker
009. Quarrying and Other	Value added/worker
010. Construction	Value added/worker
011. Manufacturing	Value added/worker
012. Food and Beverages	Value added/worker
013. Tobacco & Tobacco Prods	Value added/worker
014. Textile Mill Products	Value added/worker
015. Clothing & Other Fabr Textiles	Value added/worker
016. Footwear	Value added/worker
017. Leather & Its Prod (exc Ftwr)	Value added/worker
018. Leather & Its Prod (inc Ftwr)	Value added/worker
019. Furniture and Fixtures	Value added/worker
020. Lumb & Wood Prod (exc Furn)	Value added/worker
021. Lumb & Wood Prod (inc Furn)	Value added/worker
022. Paper and Paper Products	Value added/worker
023. Printing & Publishing	Value added/worker
024. Rubber Products	Value added/worker
025. Chemicals & Chemical Products	Value added/worker
026. Petroleum & Coal Products	Value added/worker
027. Stone and Clay Products	Value added/worker
028. Glass, Stone & Clay Prods	Value added/worker
029. Metal and Metal Products	Value added/worker
030. Primary Metals	Value added/worker
031. Iron & Steel	Value added/worker
032. Nonferrous	Value added/worker
033. Fabr Metal Prod (exc Mach)	Value added/worker
034. Machinery (exc Electrical)	Value added/worker
035. Electrical Mach and Equip	Value added/worker
036. Transportation Equipment	Value added/worker
037. Motor Vehicles, etc.	Value added/worker
038. Profess & Scientific Instruments	Value added/worker
039. Miscel Mfg (inc Instruments)	Value added/worker
040. Transportation & Warehousing	Value added/worker
041. Railroad	Passenger and ton KM cargo/worker
042. Trucking	Number of commercial vehicles/worker
043. Water	Occupational composition of labor force
044. Air	Passenger miles/worker
047. Communications	No. of letters, cables, phone calls/employee
048. Utilities	Value added/worker
049. Trade	Value added/worker
052. Finance, Insurance & Real Estate	Value added/worker
053. Services	Value added/worker
054. Government	Purchases of goods and services/worker
055. Education	Teacher-student ratio at primary and secondary level
056. Medical	Inverse of infant mortality rate

The Statistical Tables of Volume II

As described above, we first had to rearrange the raw manpower data collected from the various countries according to our own classification system before we could prepare cross-tabulations, or run correlations between productivity and occupational mix. This step required the punching for each country of a set of computer cards containing the raw occupational and industrial data, and then its coding so that a second set of cards could be prepared containing the raw data grouped according to our occupational and industrial codes. With these cards we were able to use the computer to prepare the tabulations needed. Volume II of this study contains all of the statistical tables that are necessary for the international comparison method of projecting manpower requirements.

There are three basic sets of statistical tables. The first set contains 26 country tables. Each country table represents a country at a specific date, and presents the occupational distribution of the nation's working labor force by industry.[12] The occupational distribution contains 225 occupations or groups of occupations, and the data are given in employees per 1000 persons engaged in each of the 58 industries or industry groups in our classification system. Thus, each country table contains 225 occupations or occupational groups in each of up to 58 industries. The bottom row of each such table is "employees per 1000 active population sector:" The total active population of the country is also given. From these figures one can compute the total number of persons engaged in each of the industries. Where an asterisk appears the number of employees was less than one per 1000 active population in that sector.

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[12] A list of the countries and the dates of the data can be found in the Table of Contents of Volume II.

The second set of tables in Volume II contains the statistics of the first set, but differently organized. It is the key set of tables for the projection of manpower requirements. This second set contains 52 separate industry tables,[13] and each of these gives the occupational composition of that industry for the 26 countries. Again, the same number of occupations is included and the composition is per 1000 persons engaged. What is crucial in these tables is the ranking of the country data. Each industry table ranks the countries by the level of productivity of that industry in the country. The measure of productivity is listed for each country's industry. Thus, within the range of productivities found in any single industry table one can find an occupational structure related to a specific level of productivity. Users of these tables can select a specific productivity level for an industry as a target, and then determine from the appropriate column the occupational structure associated with the selected productivity. Where necessary, users can also interpolate productivity levels and occupational structure statistics.

The third set of tables gives the cross-classification of occupations by educational attainment for 16 countries. As indicated, supra, we could not establish a single classification system for education. The educational attainment levels are those of the nation involved, but the occupational classification is the same as that of our other basic tables. Only 16 nations are represented because the other countries in our sample failed either to provide the necessary occupational detail or to classify occupations by educational attainment levels.

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[13] Because of difficulties in obtaining a meaningful measure of productivity, six industries of the 58 were not included in this set of tables. The omitted industries were: warehousing, other transportation, wholesale trade, retail trade, business services, and personal, recreation and miscellaneous services.

The view that educational levels in some of the more economically advanced countries exceed occupational needs seems to be supported by the variation these tables show in the years of schooling for specific occupations. In planning for the training of skills, the important considerations may be the minimum level of formal education needed before a person can learn to perform effectively in an occupation, and the different rates of substitution between formal education and other forms of training.

The Appendices

The appendices included in Volume I are an effort to help the reader use the tables of Volume II and to clarify some of the more complex problems raised by the statistics or by our classification systems of occupations and industries. Appendix A includes a series of summary tables of occupational composition for each of the countries included in our sample. The statistics are thus a cross-classification of 18 occupational groups by 10 economic sectors, and they provide a ready reference to the occupational and industry structure of all the nations in this study.

Appendix B lists the industries used in the classification system developed specifically for this study, and gives the code number equivalents of the International Standard Industrial Classification. With this list one can readily translate our industrial titles into the equivalent

ISIC code numbers.

Appendix D lists the occupations found in the classification system developed specifically for this study and gives the code number equivalents of the International Standard Classification of Occupations. Thus, the user of our statistics will be able to translate readily our occupational titles into their equivalent ISCO code numbers.

Nations tend to use occupational titles and industry titles to suit their own domestic needs. As a result, however, one frequently finds that the same or similar industry titles or occupational titles in two countries have different meanings and content. In our development of a series of industry titles and occupational titles, we had to subsume in our classification scheme the various titles used by the different countries. As a result, the coverage of any one of our titles may vary from country to country. Appendix C contains a series of notes, for each country in our own classification scheme, explaining the variations in the content of industries from that of the titles used in our own structure. Appendix E contains notes for the occupations. In this case, however, deviations from our occupational structure are not presented. Instead, we show the way in which we classified the titles used by each country to group the data it made available to us. The titles used by each country thus are arranged according to the occupations of our structure.

IV. TESTING THE HYPOTHESIS

As indicated, supra, the basic assumption upon which the international comparison approach to manpower projections depends is that there exists a relationship between a given occupational structure and productivity. Or, more specifically, there is a relationship between value added per employed person in a given industry and the occupational composition of the work force in the same industry.

The planning of an industrial sector requires considerable understanding of the way in which inputs are transformed into the desired outputs. In economic theory this transformation is represented by a production function that shows the outputs that can be obtained from various combinations of inputs, assuming a given state of knowledge. Most production functions in economic literature concentrate upon the combinations of capital and labor, and hence the substitution of capital for labor and vice versa. Little attention is paid to the type of labor that must be combined with a given type of capital.

Focusing attention on the types of labor rather than the relative amount of labor is a recent phenomenon. This reorientation was brought about, on the one hand, by the apparent increase in structural unemployment in highly developed economies and the growing awareness of the investment characteristic of education, and on the other hand, by the inability of some developing economies to achieve desired levels of productivity with a certain amount of capital because of a lack of skills. Solutions to the problems of unemployment and low productivity are hampered by the general failure of economic theory to incorporate labor as anything but a homogeneous input, and by the paucity of research about the work force composition of different industries and its relationships to productivity.[14]

There is reason to believe the existence of a high degree of complementarity between a specific type of production method and the kind of labor force needed for it. In other words, a certain level of technology, and thus a certain level of productivity, is represented by a specific kind of organization and capital equipment that is made to work by a labor force whose occupational composition is well defined.

This assumption can be formalized as follows: The productivity of an industry is linked to a specific occupational distribution of its labor force; and the production function in this case is of the type

$$Q = F_1 \ (K, L_1, L_2, \ldots L_n),$$

where $L_1, L_2, \ldots L_n$ are the number of workers in occupations 1, 2, ... n, and where K is the amount of type of capital. We can rewrite the equation in the following way:

$$Q/L = F_2 \ (K/L, L_1/L, L_2/L, \ldots L_n/L)$$

where L is the total number of workers. If we also assume that K/L is a function of the occupation distribution of L, then it follows that:

$$Q/L = F_3 \ (L_1/L, L_2/L, \ldots L_n/L)$$

The statistics of Volume II were used to test this formulation.

We fitted the following functions to the data of manufacturing industries:

$$y = a + b_{11} \ x_{11} + b_{21} \ x_{21} + \ldots + b_{n1} \ x_{n1}, \text{ and}$$

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[14] We shall assume that productivity is the relationship of output to a factor of production. Since we are dealing mainly with the input of labor, we refer to the productivity of labor simply as productivity.

$$\log y = a + b_{11} \log x_{11} + b_{21} \log x_{21} + \ldots + b_{ni} \log x_{n1}$$

where y_1 = productivity (value added per worker) in industry 1; and $x_{11}\ x_{21} \cdots x_{n1}$ are the proportions of occupations 1, 2, ... n in the labor force of industry 1.

The major groups used in our data were:

x_1 = Professional and Technical Workers
x_3 = Administrators and Managers
x_4 = Clerical Workers
x_6 = Sales Workers
x_7 = Manual Workers

Tables 3 and 4 contain the final equations (after the variables without statistical significance were dropped), the degree of determination, the multiple F, the F value of each coefficient, the degrees of freedom, and the level of statistical significance. The linear function applies to Table 3; the log function applies to Table 4.

These tables show that variations in productivity can be explained by differences in occupational structures; that variations in the proportion of professional and technical workers are a major determinant of productivity in almost every industry; and that the importance of other groups vary from industry to industry, and depend on the type of curve that is used to fit the data. The only occupational group whose variations seem to exert no influence on productivity is that of clerical workers.[15]

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[15] The influence of a variable has no bearing on whether it appears in the formulation. The fact that a variable does not appear does not imply that this occupation is not needed. All occupations are needed and have to be planned for. If, for example, regardless of the level of productivity, 10 percent of the labor force has to be in occupation x, the variable x may not appear in the equation but may nevertheless play an important role in determining the need for occupation x in the economy.

Table 3. Multiple Correlations of Productivity and the Occupational Composition of Industries

		R^2	F	DF_1/DF_2	Significance Level
Manufacturing	$y = -\ 2{,}991 + \underset{(17.32)}{82{,}54\ x_1} + \underset{(4.44)}{60.69\ x_3} + \underset{(2.29)}{39.44\ x_6}$	.708	13.79	3/16	.01
Food and Beverages	$y = 7{,}954 + \underset{(3.34)}{38.13\ x_3} + \underset{(1.63)}{38.67\ x_4} - \underset{(1.42)}{13.45\ x_7}$	.406	3.87	3/17	.05
Tobacco & Tobacco Products	$y = 123{,}748 - \underset{(4.70)}{157.57\ x_1} - \underset{(4.46)}{192\ x_3} - \underset{(11.15)}{144.56\ x_4} - \underset{(9.03)}{120.68\ x_7}$	.512	3.67	4/14	.05
Textile Mill Products	$y = 29{,}158 - \underset{(12.46)}{31.65\ x_7}$	.44	12.46	1/19	.01
Clothing & Other Fab. Textiles	$y = -\ 454 + \underset{(11.68)}{203.30\ x_1} + \underset{(9.52)}{41.79\ x_4} - \underset{(2.64)}{31.84\ x_6}$	.656	10.21	3/16	.01
Leather & Footwear	$y = -\ 1{,}801 + \underset{(.93)}{80.19\ x_1} + \underset{(1.56)}{32.99\ x_3} + \underset{(7.84)}{50.63\ x_4} - \underset{(1.94)}{33.26\ x_6}$	.620	4.08	4/10	.05
Furniture and Fixtures	$y = 26{,}571 - \underset{(19.17)}{27.79\ x_7}$	.615	19.17	1/12	.01
Lumber & Wood Products	$y = -\ 2{,}076 + \underset{(5.05)}{107.72\ x_1} + \underset{(16.53)}{119.39\ x_3} - \underset{(2.54)}{34.56\ x_4}$	.702	7.88	3/10	.01
Lumber & Wood Incl. Furn.	$y = 92{,}855 - \underset{(2.95)}{197.81\ x_4} + \underset{(1.30)}{188.43\ x_6} - \underset{(7.21)}{95.30\ x_7}$	.404	3.84	3/17	.05
Paper & Paper Products	$y = -\ 6{,}230 + \underset{(52.21)}{164.24\ x_1} + \underset{(8.27)}{113\ x_3} + \underset{(2.10)}{19.37\ x_4}$	.799	21.22	3/16	.01

Table 3. (Continued)

Printing & Publishing	$y = 19{,}336 - \underset{(1.44)}{24.03}\,x_3 - \underset{(2.74)}{31.23}\,x_4 + \underset{(5.99)}{28.9}\,x_6 - \underset{(3.67)}{17.69}\,x_7$	.814	17.60	4/16	.01
Rubber Products	$y = 7{,}592 + \underset{(25.61)}{146.21}\,x_1 + \underset{(1.90)}{52.70}\,x_6 - \underset{(2.53)}{12.80}\,x_7$	.772	18.07	3/16	.01
Chemical & Chemical Products	$y = -\ 6{,}990 + \underset{(20.10)}{106.87}\,x_1 + \underset{(6.12)}{63.31}\,x_6$	.674	18.66	2/18	.01
Petroleum & Coal Products	$y = -\ 3{,}782 + \underset{(26.92)}{87.67}\,x_1 + \underset{(4.14)}{77.62}\,x_3$	.675	15.62	2/15	.01
Glass, Stone & Clay Products	$y = -\ 3{,}344 + \underset{(20.10)}{166.05}\,x_1 + \underset{(6.12)}{63.31}\,x_6$	.833	26.7	2/16	.01
Metal & Metal Products	$y = -\ 2{,}326 + \underset{(21.70)}{94.37}\,x_1 + \underset{(2.68)}{41.93}\,x_3 + \underset{(2.42)}{85.46}\,x_6$	.684	11.55	3/16	.01
Primary Metals	$y = 21{,}130 + \underset{(9.14)}{161.58}\,x_1 + \underset{(2.02)}{72.22}\,x_3 + \underset{(8.37)}{596}\,x_6 + \underset{(1.65)}{16.98}\,x_7$	.601	4.90	4/13	.05
Fabr. Metal Products (Exc. Mach.)	$y = -\ 1{,}814 + \underset{(22.24)}{70.28}\,x_1 + \underset{(2.85)}{40.75}\,x_3 + \underset{(1.24)}{64.42}\,x_6$	.697	12.32	3/16	.01
Machinery Exc. Electrical	$y = -\ 768 + \underset{(4.65)}{37.55}\,x_1 + \underset{(2.41)}{42.86}\,x_3$	.306	3.76	2/17	.05
Electrical Machinery	$y = -\ 551 + \underset{(12.46)}{38.85}\,x_1 + \underset{(1.26)}{75.44}\,x_6$	.438	6.62	2/17	.01
Transportation Equipment	$y = -\ 61 + \underset{(17.10)}{71.99}\,x_1 + \underset{(2.20)}{67.41}\,x_6$	.527	8.94	2/16	.01
Misc. Manufacturing (Inc. Instruments)	$y = -\ 1{,}418 + \underset{(17.25)}{46.45}\,x_1 + \underset{(12.40)}{44.14}\,x_3$	.661	16.58	2/17	.01

Table 4. Multiple Correlations of Productivity and the Occupational Composition of Industries

		R^2	F	DF_1/DF_2	Significance Level
Manufacturing	$y = .912 + \underset{(22.20)}{.845}\, x_1 + \underset{(9.019)}{.789}\, x_3$	.666	18.02	2/18	.01
Food and Beverages	$y = 9.131 + \underset{(5.31)}{.576}\, x_1 + \underset{(3.82)}{.642}\, x_3 - \underset{(1.57)}{2.576}\, x_7$	.523	6.22	3/17	.01
Tobacco & Tobacco Products	$y = 13.889 - \underset{(4.87)}{1.346}\, x_4 + \underset{(3.64)}{.534}\, x_6 - \underset{(1.08)}{2.86}\, x_7$	.393	3.24	3/15	.10
Textile Mill Products	$y = 22.046 + \underset{(2.95)}{.39}\, x_1 + \underset{(.60)}{.23}\, x_6 - \underset{(2.71)}{5.81}\, x_7$	.484	5.33	3/17	.01
Clothing & Other Fab. Textiles	$y = 27.642 + \underset{(5.44)}{.32}\, x_1 - \underset{(2.35)}{.35}\, x_6 - \underset{(4.97)}{8.26}\, x_7$	.549	6.49	3/16	.01
Leather & Footwear	$y = .88 + \underset{(18.03)}{.71}\, x_1 + \underset{(5.54)}{.60}\, x_3 + \underset{(4.39)}{.53}\, x_4$	.722	9.55	3/11	.01
Furniture and Fixtures	$y = 43.27 + \underset{(2.87)}{.16}\, x_1 - \underset{(9.77)}{6.8}\, x_6 - \underset{(21.89)}{13.4}\, x_7$	.806	13.89	3/10	.01
Lumber & Wood Products	$y = 1.759 + \underset{(35.63)}{.43}\, x_1 + \underset{(14.40)}{1.47}\, x_3 - \underset{(4.53)}{.70}\, x_4$	.880	24.48	3/10	.01
Lumber & Wood Incl. Furn.	$y = 1.61 + \underset{(7.06)}{.26}\, x_1 + \underset{(7.72)}{.93}\, x_3$	.542	10.66	2/18	.01
Paper & Paper Products	$y = 1,179 + \underset{(39.31)}{1.00}\, x_1 + \underset{(5.77)}{.62}\, x_3$	.706	20.49	2/17	.01

Table 4. (Continued)

Printing & Publishing	$y = 17.811 - \underset{(3.10)}{1.52}\, x_4 - \underset{(19.03)}{3.94}\, x_7$	.562	11.55	2/18	.01
Rubber Products	$y = 11.272 + \underset{(21.79)}{1.08}\, x_1 - \underset{(4.35)}{3.27}\, x_7$	.735	23.60	2/17	.01
Chemical & Chemical Products	$y = -.244 + \underset{(13.38)}{1.23}\, x_1 + \underset{(2.05)}{.43}\, x_3 + \underset{(4.10)}{.46}\, x_6$	.665	11.25	3/16	.01
Petroleum & Coal Products	$y = .6851 + \underset{(17.66)}{1.18}\, x_1 + \underset{(2.87)}{.51}\, x_3$	.570	9.94	2/15	.01
Glass, Stone & Clay Products	$y = -1.230 + \underset{(48.51)}{1.66}\, x_1 + \underset{(13.57)}{1.26}\, x_4$	.855	50.49	2/17	.01
Metal & Metal Products	$y = 2.886 + \underset{(14.81)}{.85}\, x_1 + \underset{(1.83)}{.36}\, x_3 - \underset{(1.75)}{.81}\, x_4 + \underset{(1.84)}{.34}\, x_6$	.583	5.25	4/15	.01
Primary Metals	$y = 2.962 + \underset{(10.03)}{1.10}\, x_1 - \underset{(1.70)}{.71}\, x_4 + \underset{(2.08)}{.30}\, x_6$	.472	4.18	3/14	.05
Fabr. Metal Products (Exc. Mach.)	$y = 1.559 + \underset{(34.40)}{.75}\, x_1 + \underset{(5.49)}{.46}\, x_3$	.687	18.69	2/17	.01
Machinery Exc. Electrical	$y = 16.850 + \underset{(3.01)}{.47}\, x_1 - \underset{(3.99)}{1.07}\, x_4 - \underset{(3.18)}{4.2}\, x_7$	.430	4.02	3/16	.05
Electrical Machinery	$y = 2.082 + \underset{(7.92)}{.64}\, x_1 + \underset{(.37)}{.17}\, x_6$	.344	4.47	2/17	.05
Transportation Equipment	$y = 24.03 - \underset{(.98)}{.52}\, x_4 - \underset{(5.22)}{6.76}\, x_7$	.320	3.780	2/16	.05
Misc. Manufacturing (Inc. Instruments)	$y = .84 + \underset{(19.33)}{.75}\, x_1 + \underset{(10.14)}{1.06}\, x_3 - \underset{(2.19)}{.32}\, x_6$	.668	10.73	3/16	.01

The evidence seems to show that the same relationships between productivity and occupational mix hold for productivities well below those of United States industries. Thus, the idea that the productivity of an industry is reflected in the occupational composition of its labor force can be applied to international data. The difficulties in using international statistics are greater than those involved in using United States data, but the latter are not completely free of problems.[16] In any case, the spectrum of productivity levels is much wider on the international level, and we can therefore expect clear trends and more discernible patterns.

The results of these correlations clearly indicate that the data of the tables in Volume II can be used to project future manpower requirements. In all types of economic planning it is of particular importance to have proper information about the present and anticipated manpower requirements. Developing nations at various levels of productivity can make use of the statistics as the basis for projecting future manpower requirements.

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[16] One difficulty in using state data of the United States, in contrast to using international data, is that the occupational structure of an industry in a given state may come from establishments that specialize in the production of a few items. The product mixes of an industry in each of several industrially diversified countries probably are more alike than they are in each of several states in the United States. Specialization in the products of a given industry is apt to be sharper among states than among nations.

V. MANUAL FOR THE USE OF THE TABLES

Forecasting manpower requirements for the occupations of an entire economy must start from a detailed plan of the economy. Thus, it is imperative that a target for production or investment exist, since the projection of manpower requirements cannot be done in a vacuum. Most economic plans fix production targets for each sector according to expected consumption, imports and exports, or the investment goals necessary to generate a given production target.

The derivation from output targets of subsequent employment targets implicity assumes a given labor productivity. For example, if the plan calls for a target of $10,000,000 of value added in a given sector and a labor force of 4,000 workers, it assumes a productivity of $2,500 per worker. Or, if the investment goal is $20,000,000, but with a capital-output ratio of 2.0 and the same employment (or $1,250 investment per worker), we again come out with a productivity per worker equal to $2,500.

Regardless whether investment or production is given as the target, the link between output and that of manpower requirements is productivity. Because of the interdependency of production, employment and productivity, the fixing of two of the three automatically determines the third. This must be taken into account when planning. If we fix production and employment, productivity is being determined at the same time. If we fix production and productivity, employment is automatically determined.

A development process consists not only of expanding production but also of increasing productivity. For practical reasons, therefore, we should leave employment as the dependent variable. (This, of course, may not be the case if the prime concern is employment, or if a study of supply conditions shows that a given productivity is incompatible with available manpower.)

Forecasting demand for different occupations in the economy can be divided into two major steps:

A) Determine a target of output by sector or industry

B) Determine a target of productivity by sector or industry

Example

Assume that country X plans an output of value added for the Textile Mill Products Industry of $17,000,000 by 1975, and plans to raise its productivity level in the industry from its actual level of $1,040 value added per worker to approximately $1,700 value added per worker. The plan for the Textile Industry calls, therefore, for an employment of $10,000 workers by 1975.

What occupational structure of the working force in the Textile Industry is needed to achieve this level of productivity? The table for Textile Mill Products, page 80 of Volume II, shows the occupational composition of this industry at various levels of productivity for different countries. These statistics may provide the answer.

This table shows that two countries have a similar value added per worker corresponding to the neighborhood of $1,700 per worker. These countries are Belgium and the Netherlands. These two countries provide us with a range of values for each of the occupational categories. The specific procedure for making a projection of required manpower involves the following steps:

1. Determine ranges for the major groups.

The table for Textile Mill Products gives the following ranges for the major groups:

	per 1000 employees
Professional and Technical	10-20
Administrators and Managers	23-27
Clerical Workers	71-81
Sales Workers	5-7
Manual Workers	810-853
Service Workers	32-36

2. Determine ranges for minor groups included in major groups.

(a) In the Professional and Technical groups we have the following occupations:

	per 1000 employees
Engineers	0-3
Technicians	7-13

Let us assume that there can be some substitution between engineers and technicians. (The educational data reveal, for example, that in the Netherlands a significant percent of technicians have university degrees. The title of engineer in that country is given only to persons with an equivalent of more than a masters degree in engineering.) The combined group of engineers and technicians would have a range of 10 to 13 per thousand.[17]

In the case of Accountants, none are listed for Belgium and the Netherlands. This does not imply that there are no accountants in the Textile Industry in either of these countries. It means only that these countries did not separately classify accountants as defined by our classification system. (They probably were merged with bookkeepers.) Nevertheless, for planning purposes we can assume that the accountants are needed. In scanning the Textile Table we find that for the countries that list accountants as separate group, the range is from 2 to 5 per 1000 with an average of 3 per 1000.

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[17] Belgium has 10 engineers and technicians per 1000 employees in its Textile Industry, while the Netherlands had 13 per 1000. The Belgium figure is the sum of 3 engineers per 1000 and 7 technicians per 1000. The Netherlands data report only engineers and technicians combined.

(b) The range for Administrators and Managers is 23 to 27 per 1000. In view of the fact that specific proportions of these occupations do not seem to be too significant, we can use the range for the major group.

(c) For Clerical Workers, the ranges for the minor groups are:

	per 1000 employees
Bookkeepers	6-8
Telephone Operators	1
Office Machine Operators	1
Other Clerical Workers	58-71

The last category, Other Clerical Workers, is a catch-all group which includes all types of clerical workers except those specifically mentioned above. The statistics for any one country may be so aggregated that it is impossible to separate out a single critical occupations such as Secretaries, Stenographers and Typists, for example. For other countries, however, the data for this specific occupational group may be available; the range in a number of countries is from 11 to 15 per 1000. We could, therefore, use this range as the appropriate one, and subtract this range from the range 58-71 for Other Clerical Workers. This would provide the following set of ranges:

	per 1000 employees
Bookkeepers	6-8
Telephone Operators	1
Office Machine Operators	1
Secretaries, Stenographers and Typists	11-15
Other Clerical Workers	47-56

(d) Most of the people engaged in sales in this industry are Sales Representatives and the range is 5-7 per 1000.

(e) In the major group of Manual Workers, or workers directly engaged in production, the minor group, Foremen and Supervisors, does not exist in our table for Belgium and the Netherlands. These countries do not include a separate classification for Foremen and Supervisors; nevertheless we know that this group exists and that it probably is included in the other groups. For example, the minor group, Textile Workers, probably includes foremen. Again, we can get a fairly good idea of the range of this group by looking at other countries in the table that define Foremen and Supervisors specifically.

The most common range for this minor group in countries that have a higher productivity than $1,700 per worker is 20 to 30 per 1000. We can, therefore, adopt this figure for our planning purposes.

The next important minor group is Textile Workers. Their range is 581 to 729 per 1000, with the following sub-groups:

	per 1000 employees
Fiber Preparers	52-106
Spinners and Winders	160-240
Weaver and Loom fixers	180-192
Knitters	28-40
Bleachers and Dyers	57-80
Other Textile Workers	69-106

The next sub-group is Textile Printers and Pressmen. The range for Textile Printers and Pressmen is quite wide, from 2 to 15 per 1000. In many instances, however, this group is linked with the minor group of Bleachers and Dyers, and if we add these groups together we have the following range:

	per 1000 employees
Bleachers, Dyers and Printers	72-82

The range for Clothing Workers is 340-530 per 1000. Included are Tailors, Furriers, Sewers and Stitchers, and various miscellaneous apparel makers and similar workers.

The range for Metal Fabricating Workers, who include mostly Machine Setters, Smiths, and Machine Fitters and Erectors, is 9 to 14 per 1000, and for Construction Workers, 11-15 per 1000. In this latter group, the most crucial sub-groups are Carpenters and Joiners, 3-4 per 1000, and Electricians, 4-6 per 1000.

In the Transportation Workers group, the crucial sub-group is Truck Drivers, whose range is 6 to 7 per 1000. The sub-group, Dockworkers and Stevedores, includes all types of loaders and unloaders and variation in the figures can be attributed to classification differences since this sub-group could easily fit into the classification of Unskilled Laborers.

The range of Mechanics and Repairmen is 20-29 per 1000 and that of Stationary Engineers and Firemen is 8-11 per 1000.

The following is a summary of the most important occupational groups in the major category of Manual Workers:

	per 1000 employees
Foremen and Supervisors	20-30
Fiber Preparers	52-106
Spinners and Winders	160-240
Weavers and Loom Fixers	180-192
Knitters	28-40
Bleachers, Dyers and Printers	72-82
Other Textile Workers	69-106
Clothing Workers	340-530
Metal Fabricating Workers	9-14
Carpenters	3-4
Electricians	4-6
Truck Drivers	6-7
Mechanics and Repairmen	20-29
Stationary Engineers and Firemen	8-11
Mixed Skills	14-34

(f) In the Service Workers category we find the following sub-groups:

	per 1000 employees
Protective Service	2-3
Personal Service Workers[18]	30-33

3. Determine actual number of people needed in each occupational group.

In order to assess the total number of people needed in each occupation, we have to multiply the proportion of each occupation in the labor force of the industry by the employment figure of the industry. We assume a value for each occupation given by the mid-point of the range. In our case, total employment was projected at 10,000.

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[18] Mostly cleaning personnel

	Actual Number
Accountants	30
Engineers	30
Technicians	100
Managers and Administrators	250
Bookkeepers	70
Secretaries, Stenographers, Typists	130
Office Machine Operators	10
Telephone Operators	10
Messengers	10
Other Clerical Workers	515
Sales Workers	60
Foremen and Supervisors	250
Fiber Preparers	755
Spinners and Winders	2000
Weavers and Loom Fixers	1860
Knitters	340
Bleachers, Dyers and Printers	770
Other Textile Workers	875
Clothing Workers	435
Metal Fabricating Workers	115
Carpenters and Joiners	35
Electricians	50
Mechanics and Repairmen	250
Stationary Engineers and Firemen	95
Truck Drivers	65
Mixed Manual Workers	240
Protective Service Workers	25
Personal Service Workers	315
Total	9690

The remainder of the work force, 310 persons, consists mainly of laborers and other unskilled workers.

4. Determine the number of people in each occupation for the entire country.

The same procedure of 1, 2, and 3 followed for the Textile Industry must be repeated for each separate sector or industry. The total number of people required in each occupation for the entire country can be determined by adding the numbers in each occupation as obtained from tables similar to the one above.

VI. GENERAL COMMENTS

As the last section "Manual for Use of the Tables" clearly indicates, the use of the statistics in Volume II requires sophisticated judgment. A person who naively believes that our tables will produce answers mechanically will come to grief. There are no simple solutions and therefore a number of caveats must be mentioned.

A person should be familiar with the occupations and occupational structures of industries in his own country. He should understand the statistical operations involved in making manpower projections. He should be aware of the fact that the margin of error in projections often can be large. He should know that there is no substitute for good judgment, based upon knowledge of the labor market.

In limited ways the statistics furnished in Volume II can be used for purposes other than manpower projections. Where a nation knows the occupational structure of one of its industries, it may then use our statistical tables to estimate the productivity of the industry. It is possible to use the statistics as a guide in determining which industries are more labor-intensive and which are less so. In addition, the data can be used as a guide in identifying industries that use large proportions of specific occupations which are readily available or which are relatively easy to train.

The basic statistics presented in this study were collected from 19 countries, of which seven have data for two dates. We realize that had we been able to obtain similar data from additional nations our study would have proved even more valuable. We are aware that most of our statistics are for countries whose levels of productivity are relatively high. For nations that are just beginning their industrialization process many of the nations in our sample may be too highly developed economically to be used as guides. Additional statistics for countries at the lower levels of productivity would clearly make this international comparison approach to manpower projections more useful. We made every effort to collect the detailed statistics needed for our study from as many countries as possible. We think we have the data from all those countries from whom such statistics are currently available. As more nations make detailed manpower statistics available, they should be analyzed and adjusted to make them comparable with the statistics of other countries.

Most nations of the world are currently planning their decennial population censuses of 1970 or 1971. We strongly urge that a more uniform system of occupations and occupational titles be used so that international comparisons can be made more easily. We also urge nations to collect and tabulate their occupational data on a three-digit basis and their industry data on a two-digit basis. Finally, we urge nations to cross-tabulate their detailed occupational statistics and their detailed industry statistics. Such tabulations from many more countries would contribute significantly to the use of international comparisons.

APPENDIX A

Summary Tables of Occupational Composition of Sectors per 1,000 Persons Engaged

Summary Table: Argentina 1960

OCCUPATIONAL COMPOSITION OF SECTORS PER 1000 PERSONS ENGAGED

	Occupational Groups* / Industry	Agriculture, Forestry and Logging	Mining and Quarrying	Construction	Manufacturing	Transportation and Warehousing	Communications	Utilities	Trade	Finance, Insurance and Real Estate	Services
1	PROF & TECH WORKERS	-	25	26	12	44	15	31	11	24	186
3	Engineers	-	12	24	6	4	8	19	1	5	7
11	Natural Scientists	-	3	-	3	2	-	3	7	1	3
34	Other Professionals	-	2	1	2	-	2	3	1	8	23
44	Other Technicians	-	-	1	-	24	1	1	-	-	4
	All Others	-	8	-	1	14	4	5	2	10	149
54	ADMINS & MANAGERS	356	23	20	35	23	14	23	461	73	43
59	CLERICAL WORKERS	3	56	20	64	143	784	217	109	757	155
67	SALES WORKERS	1	4	-	12	2	1	3	321	103	9
71	MANUAL WORKERS	608	827	914	846	722	146	654	63	20	98
72	Supvs & Inspectors	-	-	-	-	10	2	1	-	-	-
135	Metal Fabr & Makers	1	9	3	24	4	1	6	-	-	1
164	Construction Wkrs	1	67	707	127	28	104	261	1	5	15
177	Transportation Wkrs	4	43	18	19	412	16	39	28	4	15
191	Mech & Repairmen	1	59	9	118	37	11	53	3	3	12
205	Laborers	2	138	133	17	206	7	171	18	4	23
	All Others	599	511	44	541	25	5	123	13	4	33
209	SERVICE WORKERS	3	34	9	15	29	12	30	6	10	269

*Occupational code numbers are the same as those in the volume of detailed tables.

Summary Table: Belgium 1960

OCCUPATIONAL COMPOSITION OF SECTORS PER 1000 PERSONS ENGAGED

	Industry / Occupational Groups*	Agriculture, Forestry and Logging	Mining and Quarrying	Construction	Manufacturing	Transportation and Warehousing	Communications	Utilities	Trade	Finance, Insurance and Real Estate	Services
1	PROF & TECH WORKERS	2	18	11	29	151	34	69	25	17	332
3	Engineers	1	9	3	8	3	4	27	1	3	4
11	Natural Scientists	1	-	-	1	-	-	1	-	-	2
34	Other Professionals	-	-	-	1	-	4	2	-	6	46
44	Other Technicians	-	7	5	18	70	19	36	9	3	19
	All Others	-	2	3	1	78	7	3	15	5	261
54	ADMINS & MANAGERS	897	10	38	28	20	10	32	515	90	121
59	CLERICAL WORKERS	3	48	23	97	167	746	259	97	661	154
67	SALES WORKERS	-	1	1	11	4	-	3	203	170	13
71	MANUAL WORKERS	94	905	909	761	621	180	538	130	15	54
72	Supvs & Inspectors	-	-	-	-	-	-	-	-	-	-
135	Metal Fabr & Makers	-	42	25	187	49	8	51	2	-	1
164	Construction Wkrs	-	30	654	49	25	29	269	5	3	12
177	Transportation Wkrs	1	14	29	33	429	15	33	28	3	11
191	Mech & Repairmen	-	17	6	44	31	4	21	6	2	3
205	Laborers	-	1	164	4	64	1	26	-	-	13
	All Others	93	801	31	444	23	123	138	89	7	14
209	SERVICE WORKERS	1	19	15	66	31	32	97	24	45	318

*Occupational code numbers are the same as those in the volume of detailed tables.

Summary Table: **Canada 1951**

OCCUPATIONAL COMPOSITION OF SECTORS PER 1000 PERSONS ENGAGED

Occupational Groups*	Industry	Agriculture, Forestry and Logging	Mining and Quarrying	Construction	Manufacturing	Transportation and Warehousing	Communications	Utilities	Trade	Finance, Insurance and Real Estate	Services
1	PROF & TECH WORKERS	6	55	17	33	35	88	68	19	47	319
3	Engineers	-	17	8	8	3	20	33	1	2	6
11	Natural Scientists	1	5	-	2	-	-	-	4	-	5
34	Other Professionals	-	13	1	5	1	18	5	3	7	56
44	Other Technicians	5	13	4	9	6	20	20	2	1	16
	All Others	-	7	4	9	25	30	10	9	37	236
54	ADMINS & MANAGERS	549	27	66	56	55	43	45	262	114	75
59	CLERICAL WORKERS	5	43	32	113	161	582	168	176	543	159
67	SALES WORKERS	-	2	2	28	2	11	7	286	226	7
71	MANUAL WORKERS	421	819	857	723	695	241	624	219	14	90
72	Supvs & Inspectors	7	46	32	52	56	25	46	14	-	3
135	Metal Fabr & Makers	-	31	21	133	15	-	16	6	-	1
164	Construction Wkrs	2	48	522	39	20	6	85	12	4	17
177	Transportation Wkrs	7	45	46	22	388	4	44	51	1	12
191	Mech & Repairmen	-	4	4	37	27	7	5	24	-	-
205	Laborers	264	201	209	125	171	18	218	49	3	28
	All Others	141	444	23	315	18	181	210	63	6	29
209	SERVICE WORKERS	9	24	8	17	40	20	48	19	54	330

*Occupational code numbers are the same as those in the volume of detailed tables.

Summary Table: Canada 1961

OCCUPATIONAL COMPOSITION OF SECTORS
PER 1000 PERSONS ENGAGED

	Industry Occupational Groups*	Agriculture, Forestry and Logging	Mining and Quarrying	Construction	Manufacturing	Transportation and Warehousing	Communications	Utilities	Trade	Finance, Insurance and Real Estate	Services
1	PROF & TECH WORKERS	13	80	15	52	37	102	96	21	32	308
3	Engineers	-	20	5	13	5	14	36	1	-	6
11	Natural Scientists	2	21	-	3	-	-	2	-	-	4
34	Other Professionals	2	3	4	11	4	24	15	3	9	44
44	Other Technicians	9	27	4	18	13	38	35	3	2	16
	All Others	-	9	2	7	15	26	8	14	21	238
54	ADMINS & MANAGERS	512	36	89	64	48	88	58	217	165	78
59	CLERICAL WORKERS	5	68	38	51	153	590	210	171	531	134
67	SALES WORKERS	1	5	5	39	4	12	14	280	194	7
71	MANUAL WORKERS	451	775	832	709	695	177	579	276	13	109
72	Supvs & Inspectors	6	50	32	53	67	20	59	17	1	7
135	Metal Fabr & Makers	-	37	36	114	12	1	15	7	-	4
164	Construction Wkrs	4	56	506	35	33	5	86	14	3	18
177	Transportation Wkrs	9	47	37	36	357	4	35	47	-	13
191	Mech & Repairmen	2	51	20	30	43	6	54	92	3	8
205	Laborers	288	161	165	85	150	13	110	48	2	29
	All Others	142	373	36	356	33	128	220	51	4	30
209	SERVICE WORKERS	8	22	7	17	38	21	23	18	54	284

*Occupational code numbers are the same as those in the volume of detailed tables.

Summary Table: **Chile 1960**

OCCUPATIONAL COMPOSITION OF SECTORS PER 1000 PERSONS ENGAGED

	Industry Occupational Groups*	Agriculture, Forestry and Logging	Mining and Quarrying	Construction	Manufacturing	Transportation and Warehousing	Communications	Utilities	Trade	Finance, Insurance and Real Estate	Services
1	PROF & TECH WORKERS	1	25	29	14	25	35	79	12	41	214
3	Engineers	-	9	5	2	4	3	26	-	-	2
11	Natural Scientists	1	1	-	1	-	-	1	-	1	1
34	Other Professionals	-	-	-	-	2	1	2	-	10	26
44	Other Technicians	-	12	20	7	6	24	39	1	1	8
	All Others	-	3	4	4	13	7	11	11	29	177
54	ADMINS & MANAGERS	245	20	24	31	13	8	11	434	26	29
59	CLERICAL WORKERS	4	66	21	52	104	772	182	98	675	90
67	SALES WORKERS	-	-	-	5	5	2	1	340	73	3
71	MANUAL WORKERS	743	854	904	870	820	157	682	91	21	53
72	Supvs & Inspectors	18	1	-	21	21	1	3	-	1	4
135	Metal Fabr & Makers	1	29	7	66	4	2	22	-	1	-
164	Construction Wkrs	20	88	632	82	18	20	188	3	8	7
177	Transportation Wkrs	4	38	21	21	623	41	40	21	5	9
191	Mech & Repairmen	4	78	12	118	13	12	69	4	3	5
205	Laborers	2	8	200	9	135	7	171	23	1	11
	All Others	694	612	32	553	6	74	189	39	2	17
209	SERVICE WORKERS	2	24	12	14	23	24	31	16	155	601

*Occupational code numbers are the same as those in the volume of detailed tables.

Summary Table: **Denmark 1950**

OCCUPATIONAL COMPOSITION OF SECTORS PER 1000 PERSONS ENGAGED

	Industry Occupational Groups*	Agriculture, Forestry and Logging	Mining and Quarrying	Construction	Manufacturing	Transportation and Warehousing	Communications	Utilities	Trade	Finance, Insurance and Real Estate	Services
1	PROF & TECH WORKERS	6	-	11	24	39	12	58	3	2	364
3	Engineers	-	-	8	11	4	12	29	2	-	12
11	Natural Scientists	6	-	-	-	-	-	-	-	-	4
34	Other Professionals	-	-	-	-	-	-	-	-	-	41
44	Other Technicians	-	-	-	12	18	-	29	1	2	4
	All Others	-	-	3	1	17	-	-	-	-	303
54	ADMINS & MANAGERS	480	-	16	32	27	-	36	333	152	32
59	CLERICAL WORKERS	-	-	8	34	51	842	104	99	481	159
67	SALES WORKERS	-	-	3	23	-	-	-	350	87	3
71	MANUAL WORKERS	531	-	959	881	748	135	749	205	160	94
72	Supvs & Inspectors	21	-	10	44	78	6	55	84	154	32
135	Metal Fabr & Makers	-	-	2	59	-	-	132	-	-	-
164	Construction Wkrs	-	-	583	60	2	-	65	-	-	-
177	Transportation Wkrs	5	-	11	11	452	8	10	28	-	4
191	Mech & Repairmen	-	-	1	88	21	-	66	-	-	-
205	Laborers	120	-	2	76	175	-	-	90	-	31
	All Others	385	-	350	543	20	121	421	3	6	27
209	SERVICE WORKERS	-	-	2	6	144	12	53	8	132	332

*Occupational code numbers are the same as those in the volume of detailed tables.

Summary Table: **Denmark 1960**

OCCUPATIONAL COMPOSITION OF SECTORS
PER 1000 PERSONS ENGAGED

	Occupational Groups* \ Industry	Agriculture, Forestry and Logging	Mining and Quarrying	Construction	Manufacturing	Transportation and Warehousing	Communications	Utilities	Trade	Finance, Insurance and Real Estate	Services
1	PROF & TECH WORKERS	12	10	12	24	45	24	60	11	-	415
3	Engineers	-	-	8	11	4	6	34	3	-	17
11	Natural Scientists	8	-	-	-	-	-	-	-	-	2
34	Other Professionals	-	-	-	4	-	14	-	-	-	27
44	Other Technicians	4	-	1	8	1	4	26	7	-	25
	All Others	-	10	3	1	40	-	60	1	-	344
54	ADMINS & MANAGERS	543	100	2	95	312	372	26	312	79	170
59	CLERICAL WORKERS	2	33	14	57	108	224	136	119	548	170
67	SALES WORKERS	-	-	3	25	-	-	-	302	102	14
71	MANUAL WORKERS	340	855	786	709	504	394	771	199	164	44
72	Supvs & Inspectors	-	24	8	43	6	7	54	65	157	6
135	Metal Fabr & Makers	-	17	16	50	-	-	18	-	-	-
164	Construction Wkrs	-	-	543	23	-	-	109	1	-	-
177	Transportation Wkrs	7	82	75	53	403	-	32	36	-	2
191	Mech & Repairmen	-	-	4	9	35	-	128	9	-	4
205	Laborers	17	-	61	8	12	-	42	33	-	1
	All Others	316	732	79	523	48	387	388	55	7	31
209	SERVICE WORKERS	61	2	182	18	31	-	7	57	107	184

*Occupational code numbers are the same as those in the volume of detailed tables.

Summary Table: England and Wales 1951

OCCUPATIONAL COMPOSITION OF SECTORS
PER 1000 PERSONS ENGAGED

	Industry Occupational Groups*	Agriculture, Forestry and Logging	Mining and Quarrying	Construction	Manufacturing	Transportation and Warehousing	Communications	Utilities	Trade	Finance, Insurance and Real Estate	Services
1	PROF & TECH WORKERS	3	7	13	31	24	11	50	9	11	203
3	Engineers	-	4	5	5	2	4	32	-	1	3
11	Natural Scientists	-	-	-	2	-	-	2	-	-	3
34	Other Professionals	-	-	-	4	-	-	-	1	2	16
44	Other Technicians	1	2	8	17	4	7	15	-	7	14
	All Others	2	1	-	3	18	-	11	8	1	167
54	ADMINS & MANAGERS	338	9	82	39	40	64	13	276	119	93
59	CLERICAL WORKERS	7	36	43	109	138	648	175	133	549	140
67	SALES WORKERS	-	-	2	13	3	3	19	379	214	12
71	MANUAL WORKERS	645	935	847	788	689	247	715	170	37	176
72	Supvs & Inspectors	18	56	37	49	19	58	60	5	2	7
135	Metal Fabr & Makers	1	45	16	158	22	1	47	2	2	9
164	Construction Wkrs	66	94	488	31	44	3	126	5	14	17
177	Transportation Wkrs	7	16	21	23	449	7	28	82	1	17
191	Mech & Repairmen	3	5	3	24	12	8	6	8	-	21
205	Laborers	2	9	249	138	114	14	231	31	10	49
	All Others	548	730	6	365	29	156	217	37	8	56
209	SERVICE WORKERS	1	4	4	16	103	22	20	25	58	366

*Occupational code numbers are the same as those in the volume of detailed tables.

Summary Table: England and Wales 1961

OCCUPATIONAL COMPOSITION OF SECTORS PER 1000 PERSONS ENGAGED

Occupational Groups*	Industry	Agriculture, Forestry and Logging	Mining and Quarrying	Construction	Manufacturing	Transportation and Warehousing	Communications	Utilities	Trade	Finance, Insurance and Real Estate	Services
1	PROF & TECH WORKERS	4	14	34	60	60	37	65	19	22	247
3	Engineers	-	2	12	13	4	6	36	-	4	8
11	Natural Scientists	1	1	-	3	-	-	4	-	-	3
34	Other Professionals	-	-	-	4	-	-	1	-	3	31
44	Other Technicians	2	8	8	31	33	30	22	1	1	18
	All Others	1	3	14	9	23	1	2	18	14	187
54	ADMINS & MANAGERS	418	14	84	38	25	27	37	239	65	44
59	CLERICAL WORKERS	14	47	54	115	157	646	191	143	602	155
67	SALES WORKERS	1	1	3	21	8	3	33	353	222	14
71	MANUAL WORKERS	555	898	803	713	656	251	625	189	27	158
72	Supvs & Inspectors	-	1	-	20	30	-	6	-	-	1
135	Metal Fabr & Makers	4	64	31	188	42	10	56	6	1	33
164	Construction Wkrs	48	50	556	38	22	3	198	8	10	20
177	Transportation Wkrs	8	35	29	50	442	17	54	78	2	27
191	Mech & Repairmen	-	-	-	1	1	1	1	9	-	1
205	Laborers	1	8	158	70	78	6	117	24	6	33
	All Others	494	740	29	346	41	214	193	64	8	43
209	SERVICE WORKERS	-	14	6	25	81	27	33	25	52	353

*Occupational code numbers are the same as those in the volume of detailed tables.

Summary Table: **Finland 1960**

OCCUPATIONAL COMPOSITION OF SECTORS
PER 1000 PERSONS ENGAGED

Occupational Groups* \ Industry		Agriculture, Forestry and Logging	Mining and Quarrying	Construction	Manufacturing	Transportation and Warehousing	Communications	Utilities	Trade	Finance, Insurance and Real Estate	Services
1	PROF & TECH WORKERS	4	58	38	36	61	20	62	24	20	309
3	Engineers	-	46	36	28	7	14	58	5	3	9
11	Natural Scientists	4	5	-	1	-	-	-	1	-	13
34	Other Professionals	-	2	-	5	-	2	1	4	14	31
44	Other Technicians	-	3	2	-	19	3	3	-	-	6
	All Others	-	2	-	2	35	1	-	14	3	250
54	ADMINS & MANAGERS	398	17	7	24	13	7	18	139	126	29
59	CLERICAL WORKERS	1	59	31	71	58	754	106	190	605	87
67	SALES WORKERS	-	5	1	16	2	-	3	463	106	7
71	MANUAL WORKERS	591	766	871	791	800	179	694	137	9	25
72	Supvs & Inspectors	-	-	-	6	74	6	1	--	-	5
135	Metal Fabr & Makers	-	32	24	141	1	-	28	3	-	-
164	Construction Wkrs	-	60	390	51	6	2	159	17	2	2
177	Transportation Wkrs	1	56	32	35	686	42	62	35	3	2
191	Mech & Repairmen	-	56	7	53	9	5	21	14	1	1
205	Laborers	-	41	379	69	18	7	104	41	2	5
	All Others	590	521	39	436	6	117	319	27	1	10
209	SERVICE WORKERS	1	44	13	30	38	25	50	33	122	446

*Occupational code numbers are the same as those in the volume of detailed tables.

Summary Table: **France 1954**

OCCUPATIONAL COMPOSITION OF SECTORS
PER 1000 PERSONS ENGAGED

Industry Occupational Groups*		Agriculture, Forestry and Logging	Mining and Quarrying	Construction	Manufacturing	Transportation and Warehousing	Communications	Utilities	Trade	Finance, Insurance and Real Estate	Services
1	PROF & TECH WORKERS	1	15	58	50	31	8	74	23	44	249
3	Engineers	-	7	10	14	17	4	19	3	-	6
11	Natural Scientists	-	-	-	6	-	-	-	-	-	1
34	Other Professionals	-	-	-	2	-	-	-	-	-	63
44	Other Technicians	-	-	33	13	7	-	16	2	-	4
	All Others	1	8	15	15	6	4	29	18	44	175
54	ADMINS & MANAGERS	368	4	33	42	45	294	142	406	103	155
59	CLERICAL WORKERS	2	18	27	57	174	552	178	83	626	87
67	SALES WORKERS	-	-	-	18	3	-	-	202	146	5
71	MANUAL WORKERS	632	812	822	707	503	72	418	203	-	69
72	Supvs & Inspectors	-	4	3	10	19	-	13	1	-	5
135	Metal Fabr & Makers	-	38	37	118	61	7	33	2	-	-
164	Construction Wkrs	-	24	575	11	51	-	123	1	-	17
177	Transportation Wkrs	-	9	23	12	180	7	15	36	-	6
191	Mech & Repairmen	-	12	18	39	30	-	74	11	-	1
205	Laborers	-	44	59	83	69	10	42	39	-	13
	All Others	632	681	107	434	93	48	118	113	-	27
209	SERVICE WORKERS	-	5	3	9	41	13	15	6	38	356

*Occupational code numbers are the same as those in the volume of detailed tables.

Summary Table: France 1962

OCCUPATIONAL COMPOSITION OF SECTORS PER 1000 PERSONS ENGAGED

Occupational Groups*		Agriculture, Forestry and Logging	Mining and Quarrying	Construction	Manufacturing	Transportation and Warehousing	Communications	Utilities	Trade	Finance, Insurance and Real Estate	Services
1	PROF & TECH WORKERS	3	25	59	55	45	31	120	15	14	296
3	Engineers	-	12	8	22	17	6	65	5	3	9
11	Natural Scientists	-	-	-	-	-	-	-	-	-	2
34	Other Professionals	-	-	-	3	1	3	4	-	4	57
44	Other Technicians	3	11	45	27	12	14	50	8	2	9
	All Others	-	2	6	3	15	8	1	2	5	219
54	ADMINS & MANAGERS	3	15	29	48	73	221	67	343	121	132
59	CLERICAL WORKERS	3	44	41	91	136	518	235	124	656	113
67	SALES WORKERS	-	1	2	22	10	4	11	202	137	8
71	MANUAL WORKERS	984	897	858	751	603	91	420	284	14	99
72	Supvs & Inspectors	-	4	3	12	61	4	28	4	6	7
135	Metal Fabr & Makers	-	64	42	161	47	3	35	15	-	3
164	Construction Wkrs	1	30	556	22	49	3	67	7	-	16
177	Transportation Wkrs	2	29	29	16	244	9	14	44	2	7
191	Mech & Repairmen	-	22	22	40	30	3	79	22	-	2
205	Laborers	3	41	63	114	93	8	39	52	4	24
	All Others	978	707	143	386	79	61	158	140	2	40
209	SERVICE WORKERS	2	11	3	15	46	10	30	17	31	328

*Occupational code numbers are the same as those in the volume of detailed tables.

Summary Table: Ireland 1960

OCCUPATIONAL COMPOSITION OF SECTORS
PER 1000 PERSONS ENGAGED

	Industry Occupational Groups*	Agriculture, Forestry and Logging	Mining and Quarrying	Construction	Manufacturing	Transportation and Warehousing	Communications	Utilities	Trade	Finance, Insurance and Real Estate	Services
1	PROF & TECH WORKERS	1	19	19	18	35	11	63	15	12	328
3	Engineers	-	7	13	1	3	5	39	-	3	3
11	Natural Scientists	-	2	-	1	-	-	-	-	-	6
34	Other *Professionals*	-	-	-	4	-	-	-	-	-	107
44	Other Technicians	-	-	-	2	4	6	8	-	-	4
	All Others	1	10	6	10	28	-	16	15	9	208
54	ADMINS & MANAGERS	559	3	51	31	12	94	6	305	57	48
59	CLERICAL WORKERS	-	28	26	87	152	688	176	114	623	132
67	SALES WORKERS	-	-	-	20	2	-	5	360	259	8
71	MANUAL WORKERS	438	910	898	833	710	189	708	171	13	120
72	Supvs & Inspectors	-	36	39	22	28	4	28	1	-	2
135	Metal Fabr & Makers	-	-	3	40	1	-	4	-	-	1
164	Construction Wkrs	-	69	342	35	14	7	170	2	-	2
177	Transportation Wkrs	-	50	20	38	465	12	40	53	1	11
191	Mech & Repairmen	-	57	10	48	23	3	27	6	-	38
205	Laborers	127	103	469	152	157	47	282	76	8	29
	All Others	311	595	15	498	22	116	157	33	4	37
209	SERVICE WORKERS	-	3	4	11	81	16	44	39	27	335

*Occupational code numbers are the same as those in the volume of detailed tables.

Summary Table: Israel 1960

OCCUPATIONAL COMPOSITION OF SECTORS
PER 1000 PERSONS ENGAGED

	Occupational Groups* \ Industry	Agriculture, Forestry and Logging	Mining and Quarrying	Construction	Manufacturing	Transportation and Warehousing	Communications	Utilities	Trade	Finance, Insurance and Real Estate	Services
1	PROF & TECH WORKERS	4	67	27	29	45	78	63	1	27	359
3	Engineers	-	27	18	7	4	19	34	2	2	6
11	Natural Scientists	-	13	1	2	-	-	-	-	1	10
34	Other Professionals	-	3	2	7	2	5	4	2	11	54
44	Other Technicians	1	16	12	10	22	49	23	3	3	19
	All Others	3	8	4	3	17	5	2	14	10	270
54	ADMINS & MANAGERS	72	80	70	63	52	54	60	405	138	74
59	CLERICAL WORKERS	33	98	59	72	158	521	193	116	696	181
67	SALES WORKERS	1	2	1	17	13	3	2	326	86	11
71	MANUAL WORKERS	857	704	804	776	640	305	514	102	11	78
72	Supvs & Inspectors	-	-	-	-	-	14	1	-	-	-
135	Metal Fabr & Makers	2	68	12	154	16	7	53	3	2	5
164	Construction Wkrs	39	123	689	77	22	24	165	14	2	12
177	Transportation Wkrs	7	67	13	13	415	38	37	11	3	14
191	Mech & Repairmen	2	21	7	48	19	24	19	4	1	4
205	Laborers	5	46	6	36	121	5	155	17	-	4
	All Others	802	379	77	448	47	193	84	53	3	39
209	SERVICE WORKERS	16	44	16	22	59	28	130	9	36	280

*Occupational code numbers are the same as those in the volume of detailed tables.

Summary Table: Japan 1950

OCCUPATIONAL COMPOSITION OF SECTORS
PER 1000 PERSONS ENGAGED

	Industry Occupational Groups*	Agriculture, Forestry and Logging	Mining and Quarrying	Construction	Manufacturing	Transportation and Warehousing	Communications	Utilities	Trade	Finance, Insurance and Real Estate	Services
1	PROF & TECH WORKERS	2	20	29	18	41	33	65	4	5	324
3	Engineers	-	10	15	8	8	13	52	-	-	3
11	Natural Scientists	-	-	-	1	-	-	-	-	1	6
34	Other Professionals	-	-	-	4	1	2	-	-	-	38
44	Other Technicians	1	4	4	4	4	17	8	-	1	19
	All Others	1	6	10	1	28	1	5	4	3	258
54	ADMINS & MANAGERS	309	14	21	37	49	61	26	275	101	32
59	CLERICAL WORKERS	7	105	57	100	236	805	317	83	673	218
67	SALES WORKERS	1	7	2	27	3	19	2	432	180	9
71	MANUAL WORKERS	680	827	884	782	640	71	558	139	27	173
72	Supvs & Inspectors	-	25	28	10	13	3	15	-	-	1
135	Metal Fabr & Makers	-	15	8	87	11	-	4	-	-	13
164	Construction Wkrs	-	31	362	22	13	21	95	4	-	5
177	Transportation Wkrs	1	13	10	8	290	4	8	4	4	6
191	Mech & Repairmen	-	29	2	36	33	7	11	6	-	33
205	Laborers	618	115	357	42	217	13	114	23	22	35
	All Others	61	599	117	577	63	23	311	102	1	80
209	SERVICE WORKERS	-	24	5	12	26	6	22	62	11	240

*Occupational code numbers are the same as those in the volume of detailed tables.

Summary Table: Japan 1960

OCCUPATIONAL COMPOSITION OF SECTORS PER 1000 PERSONS ENGAGED

	Industry Occupational Groups*	Agriculture, Forestry and Logging	Mining and Quarrying	Construction	Manufacturing	Transportation and Warehousing	Communications	Utilities	Trade	Finance, Insurance and Real Estate	Services
1	PROF & TECH WORKERS	-	21	21	18	9	36	53	6	8	334
3	Engineers	-	19	21	12	6	11	52	1	4	9
11	Natural Scientists	-	-	-	-	-	-	-	-	-	-
34	Other Professionals	-	-	-	4	2	16	-	1	-	64
44	Other Technicians	-	-	-	-	-	-	-	-	-	-
	All Others	-	2	-	2	1	9	1	4	4	261
54	ADMINS & MANAGERS	1	16	22	40	34	46	27	35	77	22
59	CLERICAL WORKERS	3	87	70	111	225	776	418	105	618	127
67	SALES WORKERS	1	5	3	31	3	23	3	582	242	17
71	MANUAL WORKERS	993	860	876	791	700	109	479	174	30	198
72	Supvs & Inspectors	-	-	-	-	-	-	-	-	-	-
135	Metal Fabr & Makers	-	37	36	188	12	1	10	5	-	18
164	Construction Wkrs	-	14	362	5	4	1	53	4	1	3
177	Transportation Wkrs	1	39	29	15	409	6	12	21	11	10
191	Mech & Repairmen	-	2	1	9	45	1	-	15	-	18
205	Laborers	2	94	335	58	208	13	47	48	11	40
	All Others	990	674	113	516	27	87	357	81	7	109
209	SERVICE WORKERS	1	13	9	11	25	10	17	97	25	301

*Occupational code numbers are the same as those in the volume of detailed tables.

Summary Table: **Netherlands 1960**

OCCUPATIONAL COMPOSITION OF SECTORS
PER 1000 PERSONS ENGAGED

Occupational Groups* \ Industry		Agriculture, Forestry and Logging	Mining and Quarrying	Construction	Manufacturing	Transportation and Warehousing	Communications	Utilities	Trade	Finance, Insurance and Real Estate	Services
1	PROF & TECH WORKERS	1	85	18	44	210	52	75	19	20	346
3	Engineers	-	2	1	2	-	3	3	-	-	3
11	Natural Scientists	-	1	-	1	-	-	-	-	-	4
34	Other Professionals	-	3	-	3	-	-	1	-	9	33
44	Other Technicians	1	58	12	32	59	46	70	11	7	47
	All Others	-	21	5	6	195	3	-	8	4	259
54	ADMINS & MANAGERS	498	8	57	36	24	13	14	299	70	25
59	CLERICAL WORKERS	5	60	31	109	145	585	228	139	700	177
67	SALES WORKERS	1	-	-	20	6	-	3	348	164	6
71	MANUAL WORKERS	489	814	871	743	545	321	642	171	13	56
72	Supvs & Inspectors	-	-	-	-	-	-	-	-	-	-
135	Metal Fabr & Makers	-	47	19	156	9	1	25	4	-	-
164	Construction Wkrs	-	53	617	29	12	7	162	2	4	5
177	Transportation Wkrs	2	18	16	42	447	42	55	109	3	13
191	Mech & Repairmen	-	44	7	61	24	3	32	4	1	4
205	Laborers	-	8	201	11	26	7	161	1	-	5
	All Others	487	644	11	444	27	261	207	51	5	29
209	SERVICE WORKERS	1	32	19	31	63	25	35	15	26	381

*Occupational code numbers are the same as those in the volume of detailed tables.

Summary Table: **New Zealand 1960**

OCCUPATIONAL COMPOSITION OF SECTORS PER 1000 PERSONS ENGAGED

	Occupational Groups* \ Industry	Agriculture, Forestry and Logging	Mining and Quarrying	Construction	Manufacturing	Transportation and Warehousing	Communications	Utilities	Trade	Finance, Insurance and Real Estate	Services
1	PROF & TECH WORKERS	19	50	33	24	83	19	53	28	43	404
3	Engineers	-	6	11	2	3	4	23	-	-	5
11	Natural Scientists	3	38	-	2	-	-	1	-	-	9
34	Other Professionals	-	-	-	5	-	1	-	-	4	34
44	Other Technicians	13	5	18	8	40	11	23	2	-	26
	All Others	3	1	4	7	40	3	6	26	39	330
54	ADMINS & MANAGERS	226	53	30	49	38	43	22	145	97	39
59	CLERICAL WORKERS	12	32	42	83	162	584	160	193	750	189
67	SALES WORKERS	-	-	2	65	4	-	5	378	96	17
71	MANUAL WORKERS	344	852	882	799	636	325	744	238	4	86
72	Supvs & Inspectors	18	-	4	5	5	55	7	7	1	7
135	Metal Fabr & Makers	-	35	30	131	14	5	27	5	-	3
164	Construction Wkrs	25	69	577	43	39	16	203	8	-	12
177	Transportation Wkrs	83	147	42	20	417	12	22	30	-	6
191	Mech & Repairmen	3	11	10	55	30	16	18	22	-	3
205	Laborers	11	79	188	36	87	3	108	45	11	24
	All Others	279	511	31	509	44	218	359	121	2	31
209	SERVICE WORKERS	1	4	4	13	45	19	12	9	14	259

*Occupational code numbers are the same as those in the volume of detailed tables.

Summary Table: **Norway 1960**

OCCUPATIONAL COMPOSITION OF SECTORS PER 1000 PERSONS ENGAGED

Occupational Groups* \ Industry		Agriculture, Forestry and Logging	Mining and Quarrying	Construction	Manufacturing	Transportation and Warehousing	Communications	Utilities	Trade	Finance, Insurance and Real Estate	Services
1	PROF & TECH WORKERS	4	39	19	40	195	26	89	21	38	365
3	Engineers	-	14	8	9	3	5	32	3	6	10
11	Natural Scientists	1	-	-	1	-	-	-	-	-	10
34	Other Professionals	-	2	-	6	-	-	1	1	8	38
44	Other Technicians	-	20	11	21	44	21	55	7	3	22
	All Others	3	3	-	3	148	-	1	10	21	285
54	ADMINS & MANAGERS	495	36	13	45	23	15	49	269	102	57
59	CLERICAL WORKERS	1	34	19	64	72	716	137	134	604	114
67	SALES WORKERS	-	-	-	9	4	-	-	402	177	1
71	MANUAL WORKERS	492	874	947	821	597	231	696	160	22	59
72	Supvs & Inspectors	7	-	-	-	1	50	-	-	-	7
135	Metal Fabr & Makers	-	29	29	160	-	-	15	3	-	1
164	Construction Wkrs	8	177	845	74	47	9	353	7	2	24
177	Transportation Wkrs	5	53	26	28	500	15	44	45	8	6
191	Mech & Repairmen	-	62	9	81	6	1	17	7	1	4
205	Laborers	-	16	5	29	39	2	15	74	10	6
	All Others	472	537	33	449	4	154	252	24	1	11
209	SERVICE WORKERS	2	15	6	12	104	11	25	10	53	402

*Occupational code numbers are the same as those in the volume of detailed tables.

Summary Table: Puerto Rico 1960

OCCUPATIONAL COMPOSITION OF SECTORS
PER 1000 PERSONS ENGAGED

	Industry / Occupational Groups*	Agriculture, Forestry and Logging	Mining and Quarrying	Construction	Manufacturing	Transportation and Warehousing	Communications	Utilities	Trade	Finance, Insurance and Real Estate	Services
1	PROF & TECH WORKERS	2	3	-	19	16	187	63	20	76	253
3	Engineers	1	-	-	2	1	11	25	-	2	5
11	Natural Scientists	-	3	-	2	-	-	1	-	-	1
34	Other Professionals	-	-	-	-	1	2	3	-	8	20
44	Other Technicians	-	-	-	5	1	47	13	-	1	6
	All Others	1	-	-	10	13	127	21	20	65	221
54	ADMINS & MANAGERS	134	49	-	39	36	90	27	289	141	54
59	CLERICAL WORKERS	5	17	-	52	64	461	176	100	489	137
67	SALES WORKERS	1	3	-	29	13	4	10	403	150	13
71	MANUAL WORKERS	854	903	-	837	846	226	626	170	70	187
72	Supvs & Inspectors	1	14	-	62	16	16	42	6	6	5
135	Metal Fabr & Makers	3	9	-	12	6	-	9	1	-	8
164	Construction Wkrs	2	11	-	14	4	21	116	5	3	11
177	Transportation Wkrs	21	211	-	27	123	17	37	34	1	6
191	Mech & Repairmen	1	9	-	32	26	50	43	20	2	39
205	Laborers	811	183	-	61	206	12	233	29	37	31
	All Others	15	466	-	629	465	110	146	75	21	87
209	SERVICE WORKERS	3	26	-	21	23	33	94	16	73	356

*Occupational code numbers are the same as those in the volume of detailed tables.

Summary Table: Sweden 1960

OCCUPATIONAL COMPOSITION OF SECTORS PER 1000 PERSONS ENGAGED

	Industry Occupational Groups*	Agriculture, Forestry and Logging	Mining and Quarrying	Construction	Manufacturing	Transportation and Warehousing	Communications	Utilities	Trade	Finance, Insurance and Real Estate	Services
1	PROF & TECH WORKERS	6	45	49	50	101	46	104	22	21	313
3	Engineers	-	26	42	28	8	21	81	6	3	14
11	Natural Scientists	5	2	-	3	-	-	3	-	-	4
34	Other Professionals	-	1	1	5	2	2	1	1	8	48
44	Other Technicians	1	16	6	11	2	1	1	1	4	13
	All Others	-	-	-	3	89	22	18	14	6	234
54	ADMINS & MANAGERS	488	23	17	51	28	9	34	265	115	53
59	CLERICAL WORKERS	5	45	30	85	89	741	117	187	582	105
67	SALES WORKERS	-	-	2	51	16	-	-	398	74	21
71	MANUAL WORKERS	493	774	842	707	713	152	643	114	29	42
72	Supvs & Inspectors	27	-	-	-	85	-	-	-	-	1
135	Metal Fabr & Makers	1	20	28	109	2	-	9	-	-	1
164	Construction Wkrs	3	79	647	32	13	3	248	3	14	3
177	Transportation Wkrs	3	89	30	33	493	11	45	29	2	3
191	Mech & Repairmen	-	63	9	115	29	39	49	7	2	7
205	Laborers	3	65	95	39	77	-	164	48	2	13
	All Others	456	458	33	379	14	99	128	27	9	14
209	SERVICE WORKERS	1	28	10	24	38	1	17	15	167	458

*Occupational code numbers are the same as those in the volume of detailed tables.

Summary Table: United States 1950

OCCUPATIONAL COMPOSITION OF SECTORS PER 1000 PERSONS ENGAGED

Occupational Groups* \ Industry		Agriculture, Forestry and Logging	Mining and Quarrying	Construction	Manufacturing	Transportation and Warehousing	Communications	Utilities	Trade	Finance, Insurance and Real Estate	Services
1	PROF & TECH WORKERS	5	37	36	52	27	47	77	23	31	288
3	Engineers	-	14	22	18	4	25	39	2	3	7
11	Natural Scientists	1	8	-	4	-	-	2	-	-	3
34	Other Professionals	-	2	-	7	1	5	4	1	8	46
44	Other Technicians	3	7	6	12	3	5	12	1	1	12
	All Others	1	6	8	11	19	12	20	19	19	220
54	ADMINS & MANAGERS	599	40	83	47	51	44	51	229	168	65
59	CLERICAL WORKERS	3	45	32	116	157	624	197	115	419	163
67	SALES WORKERS	1	3	4	31	3	3	11	296	236	10
71	MANUAL WORKERS	387	862	832	773	707	258	632	190	44	153
72	Supvs & Inspectors	3	46	19	38	58	16	51	10	2	8
135	Metal Fabr & Makers	-	20	29	91	27	2	17	2	-	6
164	Construction Wkrs	1	39	497	20	21	3	55	6	5	10
177	Transportation Wkrs	6	61	34	23	364	5	46	50	1	13
191	Mech & Repairmen	1	26	17	33	45	6	81	24	10	53
205	Laborers	339	-	190	80	128	7	154	32	8	21
	All Others	37	670	46	488	64	219	228	66	166	42
209	SERVICE WORKERS	1	8	4	18	41	17	17	137	91	307

*Occupational code numbers are the same as those in the volume of detailed tables.

Summary Table: United States 1960

OCCUPATIONAL COMPOSITION OF SECTORS PER 1000 PERSONS ENGAGED

Occupational Groups* \ Industry		Agriculture, Forestry and Logging	Mining and Quarrying	Construction	Manufacturing	Transportation and Warehousing	Communications	Utilities	Trade	Finance, Insurance and Real Estate	Services
1	PROF & TECH WORKERS	11	74	43	74	33	107	79	21	31	312
3	Engineers	-	5	23	27	3	40	33	2	3	10
11	Natural Scientists	3	21	-	3	-	-	2	-	-	4
34	Other Professionals	-	-	-	8	2	13	6	1	8	46
44	Other Technicians	5	15	10	22	4	20	22	2	-	14
	All Others	3	33	10	14	24	34	16	16	20	238
54	ADMINS & MANAGERS	563	57	98	50	58	77	54	190	174	56
59	CLERICAL WORKERS	7	73	43	121	172	507	198	138	463	179
67	SALES WORKERS	2	4	4	38	7	16	10	297	223	8
71	MANUAL WORKERS	407	761	792	675	680	258	616	199	35	121
72	Supvs & Inspectors	7	58	29	75	51	17	61	12	3	9
135	Metal Fabr & Makers	-	23	29	82	18	-	10	2	-	4
164	Construction Wkrs	2	47	447	17	16	1	37	6	4	8
177	Transportation Wkrs	19	70	42	29	405	2	59	43	1	9
191	Mech & Repairmen	3	45	26	35	58	7	103	41	7	41
205	Laborers	322	-	168	53	84	5	133	37	6	16
	All Others	54	518	51	384	48	226	213	58	14	34
209	SERVICE WORKERS	2	9	4	15	35	16	16	137	57	302

*Occupational code numbers are the same as those in the volume of detailed tables.

Summary Table: West Germany 1950

OCCUPATIONAL COMPOSITION OF SECTORS PER 1000 PERSONS ENGAGED

	Industry / Occupational Groups*	Agriculture, Forestry and Logging	Mining and Quarrying	Construction	Manufacturing	Transportation and Warehousing	Communications	Utilities	Trade	Finance, Insurance and Real Estate	Services
1	PROF & TECH WORKERS	2	19	56	28	177	1	80	28	26	326
3	Engineers	-	9	16	18	12	-	61	2	3	10
11	Natural Scientists	-	-	-	2	-	-	3	-	-	2
34	Other Professionals	-	1	-	1	-	-	1	-	15	71
44	Other Technicians	2	8	4	6	154	-	13	2	3	17
	All Others	-	1	36	1	9	1	2	24	5	226
54	ADMINS & MANAGERS	207	1	-	7	67	-	30	167	23	212
59	CLERICAL WORKERS	-	18	22	43	30	-	87	72	145	77
67	SALES WORKERS	-	28	27	66	48	-	116	485	745	23
71	MANUAL WORKERS	678	910	866	812	641	-	641	136	15	84
72	Supvs & Inspectors	-	14	-	3	-	-	-	1	-	1
135	Metal Fabr & Makers	-	77	88	201	104	-	105	4	1	3
164	Construction Wkrs	-	58	650	94	79	-	307	3	4	15
177	Transportation Wkrs	-	34	16	23	384	-	35	44	6	14
191	Mech & Repairmen	-	2	2	30	9	-	21	7	-	2
205	Laborers	22	32	23	48	25	-	36	49	1	5
	All Others	656	693	87	413	40	-	137	28	3	44
209	SERVICE WORKERS	98	20	14	11	22	997	28	8	38	234

*Occupational code numbers are the same as those in the volume of detailed tables.

Summary Table: West Germany 1960

OCCUPATIONAL COMPOSITION OF SECTORS PER 1000 PERSONS ENGAGED

	Industry / Occupational Groups*	Agriculture, Forestry and Logging	Mining and Quarrying	Construction	Manufacturing	Transportation and Warehousing	Communications	Utilities	Trade	Finance, Insurance and Real Estate	Services
1	PROF & TECH WORKERS	4	62	24	51	142	85	102	21	20	191
3	Engineers	-	51	3	33	20	66	71	4	2	14
11	Natural Scientists	-	-	-	1	-	-	1	-	1	2
34	Other Professionals	-	1	-	1	-	-	1	-	11	50
44	Other Technicians	3	6	2	12	105	16	16	1	-	18
	All Others	1	4	19	14	17	3	13	16	6	107
54	ADMINS & MANAGERS	310	5	11	22	35	55	25	25	45	117
59	CLERICAL WORKERS	2	39	32	96	104	701	221	151	328	232
67	SALES WORKERS	-	2	1	23	40	-	5	531	538	12
71	MANUAL WORKERS	648	871	907	768	640	125	617	159	14	126
72	Supvs & Inspectors	-	1	-	12	1	-	-	3	-	2
135	Metal Fabr & Makers	-	90	39	222	66	3	83	3	-	4
164	Construction Wkrs	-	60	640	75	52	5	281	14	-	18
177	Transportation Wkrs	1	41	22	23	430	30	37	39	8	26
191	Mech & Repairmen	-	2	2	38	12	12	21	13	-	5
205	Laborers	48	26	177	63	60	4	56	46	3	21
	All Others	599	651	27	335	19	71	139	41	3	50
209	SERVICE WORKERS	33	23	4	18	25	27	42	15	47	285

*Occupational code numbers are the same as those in the volume of detailed tables.

Summary Table: **Yugoslavia 1960**

OCCUPATIONAL COMPOSITION OF SECTORS PER 1000 PERSONS ENGAGED

	Industry Occupational Groups*	Agriculture, Forestry and Logging	Mining and Quarrying	Construction	Manufacturing	Transportation and Warehousing	Communications	Utilities	Trade	Finance, Insurance and Real Estate	Services
1	PROF & TECH WORKERS	28	22	59	44	65	46	47	24	31	320
3	Engineers	3	5	13	8	3	3	9	1	-	4
11	Natural Scientists	12	1	1	1	-	-	1	1	2	3
34	Other Professionals	1	-	1	2	1	3	1	3	11	34
44	Other Technicians	2	14	36	27	46	36	27	4	2	16
	All Others	10	2	8	6	15	4	9	15	16	263
54	ADMINS & MANAGERS	211	8	11	14	12	99	28	48	79	66
59	CLERICAL WORKERS	102	46	52	82	94	595	130	210	806	189
67	SALES WORKERS	10	3	3	12	6	2	5	326	4	5
71	MANUAL WORKERS	584	871	807	794	747	211	582	339	19	78
72	Supvs & Inspectors	8	35	27	40	21	13	22	135	2	6
135	Metal Fabr & Makers	8	28	33	98	27	3	17	-	-	1
164	Construction Wkrs	24	50	412	42	98	6	216	3	-	14
177	Transportation Wkrs	2	10	14	1	436	28	46	57	5	12
191	Mech & Repairmen	14	37	40	78	62	25	79	6	1	9
205	Laborers	121	109	240	141	75	16	113	100	2	19
	All Others	407	602	41	394	28	120	89	38	9	17
209	SERVICE WORKERS	51	37	39	43	69	31	184	36	39	312

*Occupational code numbers are the same as those in the volume of detailed tables.

APPENDIX B

Industry Titles of the International Manpower Study (IMS)
With Corresponding Titles of
The International Standard Industrial Classification
Of All Economic Activities (ISIC) [a]

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[a] See Statistical Office of the United Nations, International Standard Industrial Classification of All Economic Activities, Statistical Papers Series M, No. 4, Rev. 1 (New York: United Nations, 1958)

IMS INDUSTRY TITLES		CORRESPONDING ISIC TITLES	
001	Agriculture, Forestry and Fishing	0	Agriculture, Forestry, Hunting and Fishing
002	Agriculture	01	Agriculture
003	Forestry and Logging	02	Forestry and Logging
004	Fishing	03 04	Hunting, Trapping and Game Propagation Fishing
005	Mining and Quarrying	1	Mining and Quarrying
006	Coal	11	Coal Mining
007	Metal	12	Metal Mining
008	Petroleum and Natural Gas	13	Crude Petroleum and Natural Gas
009	Quarrying and Other	14 19	Stone Quarrying, Clay and Sand Pits Other Non-Metallic Mining and Quarrying
010	Construction	4	Construction
011	Manufacturing	2-3	Manufacturing Less Part of 242 Repair of Boots and Shoes - Cobbling; repair shops that also make footwear are included in manufacturing Less 384 Repair of Motor Vehicle
012	Food and Beverages	20 21	Food Manufacturing Industries, except Beverage Industries Beverage Industries
013	Tobacco and Tobacco Products	22	Tobacco Manufactures
014	Textile Mill Products	23	Manufacture of Textiles

015	Clothing and Other Fabricated Textiles	243 244	Manufacture of Wearing Apparel, except Footwear Manufacture of Made-Up Textile Goods, except Wearing Apparel
016	Footwear	241	Manufacture of Footwear Part of 242 Repairers who also make Footwear
017	Leather, and Its Products, Excluding Footwear	29	Manufacture of Leather and Leather and Fur Products, except Footwear and other Wearing Apparel
018	Leather and Its Products Including Footwear	241 29	Manufacture of Footwear Manufacture of Leather and Leather and Fur Products, except Footwear and other Wearing Apparel
019	Furniture and Fixtures	26	Manufacture of Furniture and Fixtures
020	Lumber and Wood Products, Except Furniture	25	Manufacture of Wood and Cork, except Manufacture of Furniture
021	Lumber and Wood Products, Including Furniture	25 26	Manufacture of Wood and Cork, except Manufacture of Furniture Manufacture of Furniture and Fixtures
022	Paper and Paper Products	27	Manufacture of Paper and Paper Products
023	Printing and Publishing	28	Printing, Publishing and Allied Industries
024	Rubber Products	30	Manufacture of Rubber Products
025	Chemicals and Chemical Products	31	Manufacture of Chemicals and Chemical Products
026	Petroleum and Coal Products	32	Manufacture of Products of Petroleum and Coal

027	Stone and Clay Products	331 333 334 339	Manufacture of Structural Clay Products Manufacture of Pottery, China and Earthenware Manufacture of Cement (Hydraulic) Manufacture of Non-Metallic Mineral Products Not Elsewhere Classified
028	Glass, Stone and Glass Products	33	Manufacture of Non-Metallic Mineral Products, except Products of Petroleum and Coal
029	Metal and Metal Products	34 35	Basic Metal Industries Manufacture of Metal Products, except Machinery and Transport Equipment
030	Primary Metals	34	Basic Metal Industries
031	Iron and Steel	341	Iron and Steel Basic Industries
032	Nonferrous	342	Non-Ferrous Metal Basic Industries
033	Fabricated Metal Products (except Machinery)	35	Manufacture of Metal Products, except Machinery and Transport Equipment
034	Machinery (except Electrical)	36	Manufacture of Machinery, except Electrical Machinery
035	Electrical Machinery and Equipment	37	Manufacture of Electrical Machinery, Apparatus, Appliances and Supplies
036	Transportation Equipment	38	Manufacture of Transport Equipment
037	Motor Vehicles, etc.	383 385 386	Manufacture of Motor Vehicles Manufacture of Motorcycles and Bicycles Manufacture of Aircraft

038	Professional and Scientific Instruments	391 392 393	Manufacture of Professional, Scientific, Measuring and Controlling Instruments Manufacture of Photographic and Optical Goods Manufacture of Watches and Clocks
039	Miscellaneous Manufacturing (including Instruments)	394 395 399	Manufacture of Jewellery and Prelated Articles Manufacture of Musical Instruments Manufacturing Industries Not Elsewhere Classified
040	Transportation and Warehousing	71 72	Transport Storage and Warehousing
041	Railroad	711	Railway Transport
042	Trucking	714	Road Transport Not Elsewhere Classified
043	Water	715 716	Ocean Transport, except in Coastal Waters Water Transport, except Ocean Transport
044	Air	717	Air Transport
045	Warehousing	72	Storage and Warehousing
046	Other	712 713 718 719	Tramway and Omnibus Operators Road Passenger Transport, except Omnibus Operators Services Incidental to Transport Transport Not Elsewhere Classified
047	Communications	73	Communication
048	Utilities	5	Electricity, Gas Water and Sanitary Services
049	Trade	61	Wholesale and Retail Trade

050	Wholesale Trade	611	Wholesale Trade
051	Retail Trade	612	Retail Trade
052	Finance, Insurance and Real Estate	62	Banks and Other Financial Institutions
		63	Insurance
		64	Real Estate
053	Services		Part of 242 Repair of Boots and Shoes - Cobbling, excluding Repair Shops that also make Footwear
		384	Repair of Motor Vehicles
		8	Services
054	Government	81	Government Services
055	Education	821	Education Services
056	Medical	822	Medical and Other Health Services
057	Business	83	Business Services
058	Personal, Recreation, Miscellaneous		Part of 242 Repair of Boots and Shoes - Cobbling, excluding Repairers who also make Footwear
		384	Repair of Motor Vehicles
		823	Research and Scientific Institutions
		824	Religious Organizations
		825	Welfare Institutions
		826	Trade Associations and Professional and Labor Organizations
		827	Libraries, Museums and Botanical and Zoological Gardens
		829	Community Services Not Elsewhere Classified
		84	Recreation Services
		85	Personal Services

APPENDIX C

INDUSTRY NOTES

Our industrial code, which closely follows the International Standard Industrial Classification of All Economic Activities (ISIC) of the United Nations, was used to standardize the industry classifications of the original data. Complete Standardization among countries was impossible because of differences in their industrial codes.

These notes list the industries in each country for which standardization was not possible and briefly indicate the nature of the deviation from our industrial code. Unlisted industries correspond to our code, provided data for these industries appear in our detailed country and industry tables. Note that a blank space in an industry column in these tables does not mean that an industry does not exist in a particular country. More likely, the industry is included with another industry because of the manner in which the country's industrial code grouped the original data.

INDUSTRY NOTES

COUNTRY	INDUSTRY NUMBER	NOTES
Argentina 1960	058	Includes Services to the Public
Belgium 1960	015	Includes Footwear
	056	Includes Veterinarian Services
	058	Omits Libraries, etc.
Canada 1961	056	Includes Welfare Services
Denmark 1960	012	Includes Tobacco and Tobacco Products
	045	Includes Travel Agencies, Marine Brokers and Salvage Companies
	046	Land Transport, including Tramways and Bus Lines
England and Wales 1961	045	Includes Services Incidental to Transport
Finland 1960	015	Includes Footwear
	042	Includes Road Transport, including Bus Lines
	056	Includes Social Services
	057	Includes Community Services
France 1954	002	Includes Forestry
	013	Includes Manufacture of Matches
	025	Includes Rubber Products
	033	Includes Manufacture of Diverse Metal Articles, chiefly hardware and tools; and Mechanical and Electrical Repairing
	034	Includes Transportation Equipment
France 1962	043	Includes Air Transport
	046	Land Transportation
	054	Includes Educational, Research, Social Welfare Services, etc.
	058	Includes Medical and Business Services
Ireland 1960	046	Omnibus and Other Road Passenger Transport

Israel 1960	038	Diamond Industry
	046	Road Passenger Transport
Netherlands 1960	001	Includes Land Reclamation
	015	Includes Footwear, except Rubber
	042	Includes Tramways and Bus Lines
New Zealand 1961	015	Includes Footwear
	055	Educational, Medical and Business Services
Norway 1960	015	Includes Footwear
	046	Land Transport
Puerto Rico 1960	034	Includes all types of machinery
Sweden 1960	012	Includes Tobacco and Tobacco Products
	025	Includes Petroleum and Coal Products
	034	Includes Electrical Machinery
	046	Air and Land Transport
Yugolslavia 1961	046	Road and Urban Transport

APPENDIX D

Occupational Titles of the International Manpower Study (IMS)
With Corresponding Titles of the
International Standard Classification of Occupations (ISCO) [a]

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[a] See International Labour Office, International Standard Classification of Occupations, (Geneva: ILO, 1958)

ABBREVIATED IMS OCCUPATIONAL TITLES	COMPLETED IMS OCCUPATIONAL TITLES	CORRESPONDING ISCO TITLES	
001 Prof & Tech Wkrs	Professional & Technical Workers	0	Professional, Technical & Related Workers
		2-99.36	Clerk (Legal)
		4-31.70	Fish Hatcher
		4-41.15	Cruiser, Timber
		6-0	Deck Officers, Engineer Officers & Pilots, Ship
		6-2	Aircraft Pilots, Navigators & Flight Engineers
		6-62	Traffic Controllers & Dispatchers, Transport LESS: 6-62.40 Railway Signalmen, 6-62.50 Shunter, 6-62.60 Dispatcher, Road Transport
		6-72	Radio Communication Operators
		6-93	Inspectors, Traffic Controllers & Dispatcher, Communication LESS: Inspectors
		7-41.45	Maker & Repairman, Dental Prosthesis
		8-29.15	Taster, Coffee or Tea
		8-29.20	Taster, Wine or Liquor
		9-6	Athletes, Sportsmen & Related Workers
		9-7	Photographers & Related Camera Operators
		9-8	Embalmers & Undertakers
		Part of 9-99.90	Those rendering first aid to individuals
002 Accountants	Accountants & Auditors	0-Y1	Accountants, Professional
003 Engineers	Engineers	0-02	Engineers
004 Civil	Civil Engineer	0-02.02 to 0-02.22	Civil Engineers
005 Electrical	Electrical & Electronic Engineer	0-02.24 to 0-02.36	Electrical Engineers

006	Mechanical	Mechanical Engineer	0-02.38 to 0-02.58 0-02.90	Mechanical Engineers Naval Architects
007	Chemical	Chemical Engineer	0-02.60 to 0-02.64 0-02.70 Part of 0-02.72	Chemical Engineers Ceramic & Glass Engineer Chemical engineers, other
008	Mining	Mining Engineer	0-02.74 to 0-02.82	Mining Engineers
009	Other	Other Engineer	0-02.66 0-02.68 Part of 0-02.72 0-02.84 0-02.86 0-02.88 0-02.99	Metallurgist (Extractive) Metallurgist (Physical) Metallurgical engineers, other Industrial Efficiency Engineer Safety Engineer Agricultural Engineer Engineers N.E.C.
010	Architects	Architects	0-01 0-23.60	Architects Landscape Planner
011	Natural Scientists	Natural Scientists	0-1 0-2	Chemists, Physicists, Geologists & Other Physical Scientists Biologist, Veterinarians, Agronomists & Related Scientists LESS: 0-23.60-Landscape Planners
012	Chemist	Chemist	0-11	Chemists

013	Physicist	Physicist	0-12	Physicists
014	Agronomist	Agronomist	0-23	Agronomists, Silviculturists & Horticultural Scientists LESS: 0-23.60-Landscape Planner (see Architects 010)
015	Biologist	Biologist	0-22	Biologists & Animal Scientists N.E.C.
016	Veterinarian	Veterinarian	0-21	Veterinarians
017	Other	Other Natural Scientist	0-19 0-Y9.35	Physical Scientists N.E.C. Mathematicians
018	Teachers	Teachers	0-6	Teachers
019	University	University & College Teachers	0-61	University Teachers
020	Other	Secondary School, Primary School & Other Teacher	0-69	Teachers N.E.C.
021	Medical Professions	Medical Professions	0-31 0-51 0-52 0-59.20 0-59.40	Physicians, Surgeons & Dentists Pharmacists Optometrists Osteopath Dietician
022	Phys & Surgeon	Physician & Surgeon	0-31	Physicians & Surgeons
023	Dentist	Dentist	0-32	Dentists

024	Pharmacist	Pharmacist	0-51	Pharmacists
025	Other	Other Medical Profession	0-52 0-59.20 0-59.40	Optometrists Osteopath Dietician
026	Nurses	Nurses	0-4 Part of 9-99.90	Nurses & Midwives Those rendering first aid to individuals
027	Prof Nurse	Professional Nurse	0-41 Part of 0-49.90	Nurses, Professional Student Professional Nurses
028	Midwife	Midwife	0-42	Midwives
029	Other	Other Nurse	0-49 Part of 9-99.90	Nurses N.E.C. LESS: part of 0-49.90 student professional nurses (see Professional Nurse 027) Those rendering first aid to individuals
030	Marine & Air Offs	Marine & Aircraft Officers	6-0 6-21	Deck Officers, Engineer Officers & Pilots, Ship Aircraft Pilots, Navigators & Flight Engineers
031	Air Pilot & Nav	Aircraft Pilot & Navigator	6-21	Aircraft Pilots, Navigators, & Flight Engineers
032	Marine Deck Off	Marine Deck Officer	6-01	Deck Officers & Pilots, Ship
033	Marine Engineer	Marine Engineer	6-02	Engineer Officers, Ship

034	Other Professionals	Other Professionals	0-7 0-8 0-92 0-Y	Clergy & Related Members of Religious Orders Jurists Authors, Journalists & Related Writers Other Professional, Technical & Related Workers LESS: 0-Y1 Accountants, Professional; 0-Y9.35 Mathematician; 0-Y9.62 Designer (Industrial & Commercial Products); 0-Y9.65 Taxidermist; 0-Y9.90 Professional, Technical & Related Workers N.E.C., Other
035	Lawyer & Judge	Lawyer & Judge	0-81	Jurists
036	Actuary, Stat, Ec	Actuary, Statistician & Economist	0-Y4	Economists, Actuaries & Statisticians
037	Auth & Journalist	Author & Journalist	0-92 0-Y9.53	Authors, Journalists & Related Writers Translator
038	Social Worker	Social Worker	0-Y2	Social Workers
039	Clergy & Relig Wkr	Clergyman & Religious Worker	0-71	Clergy & Related Members of Religious' Orders
040	Other	Other Professional Not Elsewhere Classified	0-Y3 0-Y9.20 0-Y9.23 0-Y9.26 0-Y9.29 0-Y9.32 0-Y9.38 0-Y9.41 0-Y9.44 0-Y9.47 0-Y9.50 0-Y9.56	Librarians & Archivists Sociologist Anthropologist Historian Political Scientist Geographer Phychologist Personnel Specialist, Industrial Student Personnel Counselor Occupational Analyst Philologist Interpreter

041 Health Technicians	Health Technicians	0-53	Medical Technicians
		0-59.30	Chiropractor
		0-59.90	Professional Medical Workers N.E.C., Other
		7-41.45	Maker & Repairman, Dental Prosthesis
042 Med & Dental Tech	Medical & Dental Technician	0-53.40	X-Ray Operator, Medical
		Part of 0-53.90	Those giving dental prophylactic treatments & those operating electro-cardiograph & electro-encephalograph machines to obtain graphic records of patients' heart & brain conditions
		7-41.45	Maker & Repairman, Dental Prosthesis'
043 Other	Other Health Technician	0-53.20	Physiotherapist
		0-53.30	Masseur
		0-53.90	Medical Technicians, Other LESS: those giving dental prophylactic treatments, those operating electro-cardiograph & electro-encephalograph machines to obtain graphic records of patients' heart & brain conditions (see medical & dental technicians 042)
		0-59.30	Chiropractor
		0-59.90	Professional Medical Workers N.E.C., Other
044 Other Technicians	Other Technicians	0-03	Surveyors
		0-X1	Draughtsmen
		0-X9	Science & Engineering Technicians N.E.C. & Laboratory Assistants, Other
		Part of 0-Y9.62	Designer(Industrial & Commercial Products) LESS: designers of clothing, textiles, pottery, glassware & jewelry products
		0-Y9.65	Taxidermist
		Part of 0-Y9.90	Those observing, recording & calculating the time taken by workers to perform industrial operations, those estimating from plans & specifications prepared by architects & engineers the quantity of materials & labor required to complete any given construction project

044	Other Technicians (Con't.)	Other Technicians	4-31.70	Fish Hatchers
			4-41.15	Cruiser, Timber
			6-62	Traffic Controllers & Dispatcher, Transport LESS: 6-62.40 Railway Signalman; 6-62.50 Railway Shunter; 6-62.60 Dispatcher, Road Transport
			6-72	Radio Communication Operators
			6-93	Inspectors, Traffic Controllers & Dispatchers, Communication LESS: Inspectors
			9-71	Photographers & Related Camera Operators
045	Traffic Contr. Disp	Traffic Controller & Dispatcher	6-62.15	Aircraft Traffic Controller
			6-62.20	Aircraft Dispatcher
			6-62.30	Railway Dispatcher
			6-62.90	Traffic Controllers & Dispatchers, Transport, Other
			6-93.10	Dispatcher, Communication Traffic
			Part of 6-93.90	Traffic Controllers & Dispatcher, Communication, N.E.C. (Inspectors included with Inspector & Grader 074)
046	Surveyor	Surveyor	0-03	Surveyors
047	Draft & Design	Draftsman & Designer	0-X1	Draughtsmen
			0-X9.62	Designer (Industrial & Commercial Products) LESS: designers of clothing, textiles, pottery, glassware & jewelry products (see Other Professional & Technical Workers 053)
048	Radio & TV Oper	Radio & Television Operator	6-72	Radio Communication Operators
049	Photo & Cameraman	Photographer & Cameraman	9-71	Photographers & Related Camera Operators

050	Other	Other Technicians Not Elsewhere Classified	0-X9	Science & Engineering Technicians N.E.C. & Laboratory Assistants
			0-Y9.65	Taxidermist
			Part of 0-Y9.90	Those observing, recording & calculating the time taken by workers to perform industrial operations, those estimating from plans & specifications prepared by architects & engineers the quantity of materials & labor required to complete any construction project
			4-31.70	Fish Hatcher
			4-41.15	Cruiser, Timber
051	Athletes-Sportsmen	Athletes & Sportsmen	9-61	Athletes, Sportsmen & Related Workers
052	Artists-Entertainers	Artists & Entertainers	0-91	Painters, Sculptors & Related Creative Artist LESS: 0-91.50 Interior-Decoration Designer, 0-91.55 Display Artist (see Other Professional & Technical Workers 053)
			0-93	Actors, Musicians, Dancers & Related Workers
053	Other Prof-Tech Wkrs	Other Professional & Technical Workers	0-91.50	Interior-Decoration Designer
			0-91.55	Display Artist
			0-Y9.59	Patent Agent
			Part of 0-Y9.62	Designers of clothing, textiles, pottery, glassware & jewelry products
			Part of 0-Y9.90	Those conducting organized parties through an art gallery or museum & giving informal professional lectures on exhibits, those studying & classifying books & objects d'art
			2-99.36	Clerk (Legal)
			8-29.15	Taster, Coffee or Tea
			8-29.20	Taster, Wine or Liquor
			9-81	Embalmers & Undertakers

054	Admins & Mgrs	Administrators & Managers	1-0	Administrators & Executive Officials, Government
			1-1	Directors, Managers & Working Proprietors
			3-0	Working Proprietors, Wholesale & Retail Trade
			4-0	Farmers & Farm Managers
			6-61.30	Station Master, Railway
			6-61.40	Goods Agent, Railway
			9-99.50	Bookmaker, Sport
055	Gov't Officials	Government Officials	1-01	Administrators & Executive Officials, Government
056	Proprietors	Proprietors	Part of 1-1	Working Proprietors (Directors, & Managers included with Employed Managers 057, or with Other Administrators and Managers 058)
			3-01	Working Proprietors, Wholesale Trade
			3-02	Working Proprietors, Retail Trade
			Part of 4-01	Farmers LESS: Farm Managers (see Employed Managers 057)
057	Employed Managers	Employed Managers	Part of 1-1	Directors, Managers LESS: Working Proprietors (see Proprietors 056); Part of 1-15.30 producers of theatrical performances (see Other Administrators & Managers 058)
			Part of 4-01	Farm Managers LESS: Farmers, (see Proprietors 056)
			6-61.30	Station Master, Railway
			6-61.40	Goods Agent, Railway
058	Others	Other Administrators & Managers	Part of 1-15.30	Producers of theatrical performances
			9-99.50	Bookmaker, Sport

059	Clerical Wkrs	Clerical Workers	2-01	Bookkeepers & Cashiers
			2-11	Stenographers & Typists
			2-91	Office-Machine Operators
			2-99	Clerical Workers N.E.C. LESS: 2-99.36 Clerk (Legal)
			6-62.60	Dispatcher, Road Transport
			6-71	Telephone & Telegraph Operators
			6-8	Postmen & Messengers
			Part of 6-92.90	Those selling teckets on means of transportation other than bus or train
			Part of 9-01.90	Those investigating fire sites to determine cause of fire & degrees of personal or company liability--if any--or to appraise damage done
060	Bookprs-Cashiers	Bookkeepers, Cashiers & Tellers	2-01	Bookkeepers & Cashiers
			Part of 6-92.90	Those selling tickets on means of transportation other than bus or train
061	Secys, Stenos, Typts	Secretaries, Stenographers & Typists	2-11	Stenographers & Typists
062	Office Mach Opers	Office Machine Operators	2-91	Office-Machine Operators
			6-71.40	Teleprinter Operator
063	Telegraph Opers	Telegraph Operators	6-71.30	Telegrapher
			Part of 6-71.90	Telegraph Operators N.E.C.
064	Postmen	Postmen	6-81	Postmen

065	Messengers & Attends	Messengers & Office Attendants	Part of 2-99.29	Library clerks who just issue books on loan, mark them with date of issue or return & check incoming books, or who just arrange & replace books in correct order on shelves
			6-82	Messengers
066	Others	Other Clerical Workers	2-99	Clerical Workers N.E.C. LESS: 2-99.36 Clerk (Legal) (see Other Professional & Technical Workers 053); part of 2-99.29 library clerks who just issue books on loan, mark them with date of issue or return & check incoming books, or who just arrange & replace books in correct order on shelves (see Messengers
			6-62.60	Dispatcher, Road Transport
			6-71.15	Telephone, Switchboard Operator (Public Service)
			6-71.20	Telephone Switchboard Operator (Private Exchange)
			Part of 6-71.90	Telephone operators n.e.c., for example, those transmitting messages by telephone
			9-01.90	Those investigating fire sites to determine cause of fire & degree of personal or company liability--if any--or to appraise damage done
067	Sales Wkrs	Sales Workers	3-1	Insurance & Real Estate Salesmen, Salesmen of Securities & Services & Auctioneers
			3-2	Commercial Travelers & Manufacturers' agents
			3-3	Salesmen, Shop Assistants & Related Workers
068	Sales Reps & Brokers	Sales Representatives & Brokers	3-11	Insurance & Real Estate Salesmen, Salesmen of Securities & Services & Auctioneers
			3-21	Commercial Travelers & Manufacturers' Agents
069	Salesmen & Assts	Salesmen & Sales Assistants	3-31	Salesmen & Shop Assistants
			3-32.30	Canvesser
			3-39.30	Demonstrator

070 Others	Other Sales Workers	3-32	Street Vendors, Canvassers & News Vendors LESS: 3-32.30 Canvessor (see Salesmen & Sales Assistants 069)
		3-39.20	Petrol-Service-Station Attendant
		3-39.90	Salesmen, Shop Assistants & Related Workers N.E.C., Other
071 Manual Workers	Manual Workers	4	Farmers, Fishermen, Hunters, Loggers & Related Workers LESS: 4-0 Farmers & Farm Managers; 4-31.70 Fish Hatcher; 4-41.15 Cruiser, Timber
		5	Miners, Quarrymen & Related Workers
		6-1	Deck & Engine-Room Ratings (Ship), Barge Crews & Boatmen
		6-3	Drivers & Firemen, Railway Engine
		6-4	Drivers, Road Transport
		6-5	Conductors & Brakemen, Railway
		6-61.15	Transport Service Inspector (Railway)
		6-61.20	Transport Service Inspector (Road)
		6-61.90	Inspectors & Supervisors, Transport, Other
		6-62.40	Railway Signalman
		6-62.50	Railway Shunter
		6-91	Conductors, Road Transport
		6-92	Workers in Transport Occupations N.E.C. LESS: part of 6-92.90 those selling tickets on means of transportation other than bus or train
		Part of 6-93.90	Inspectors (communication) n.e.c.
		6-94	Workers in Communication Occupations N.E.C.
		7/8	Craftsmen, Production-Process Workers & Laborers N.E.C. LESS: 7-41.45 Maker & Repairman, Dental Prothesis; 8-29.15 Taster, Coffee or Tea: 8-29.20 Taster, Wine or Liquor; part of 8-81.90 those carrying hand baggage at railway or bus stations, airports or piers
		Part of 9-99.90	Those pasting advertising posters & notices on walls & billboards

072	Supvs & Inspectors	Supervisors & Inspectors	Part of 4-41.90	Those examining logs & grading them according to quality
			6-51.15	Conductor, Railway; Pullman-Car Conductor
			6-61.15	Transport Service Inspector (Railway)
			6-61.20	Transport Service Inspector (Road)
			6-61.90	Inspectors & Supervisors, Transport, Other
			Part of 6-93.90	Inspectors (communication) n.e.c.
			7-01.15	Grader & Classer, Fibre Wool Sorter
			7-09.15	Examiner, Fabrics
			7-79.30	Grader, Wood
			8-41.20	Grader (Tobacco)
			Part of 8-42.90	Those examining wrapper leaves & sorting them for color & size, those examining finished cigars for imperfactions and sorting for color and size
			Part of 8-43.90	Those examining cigarettes for proper filling, printing, gluing; those checking weight of cigarettes & measuring their length on gauge
			8-54.20	Hide & Skin Grader
			8-54.65	Pelt Grader
			8-57.15	Grader (Stone)
073	Foreman & Supv	Foreman & Supervisor	6-51.15	Conductor, Railway; Pullman-Car Conductor
074	Inspector & Grader	Inspector & Grader	Part of 4-41.90	Those examining logs & grading them according to quality
			6-61.15	Transport Service Inspector (Railway)
			6-61.20	Transport Service Inspector (Road)
			6-61.90	Inspectors & Supervisors, Transport, Other
			Part of 6-93.90	Inspectors (communication) n.e.c.
			7-01.15	Grader & Classer, Fibre Wool Sorter
			7-09.15	Examiner, Fabrics
			7-79.30	Grader, Wood
			8-41.20	Grader, Tobacco
			Part of 8-42.90	Those examining wrapper leaves & sorting them for color & size, those examining finished cigars for

074	Inspector & Grader (Con't.)	Inspector & Grader		imperfections & sorting for color & size
			Part of 8-43.90	Those examining cigarettes for proper filling, printing, gluing; those checking weight of cigarettes & measuring their length on gauge
			8-54.20	Hide & Skin Grader
			8-54.65	Pelt Grader
			8-57.15	Grader (Stone)
075	Extractive Wkrs (Con't.)	Extractive Workers	4-1	Farm Workers N.E.C. LESS: 4-11.45 Operator, Farm Equipment (Motor Driver); 4-11.75 Farm Laborer
			4-2	Hunters & Related Workers
			4-3	Fishermen & Related Workers LESS: 4-31.70 Fish Hatcher
			4-4	Loggers & Other Forestry Workers LESS: 4-41.15 Cruiser, Timber; part of 4-41.90 those loading logs into chutes & stacking logs preparatory to transport, those hauling or snigging logs in forest to truck loading platforms, those examining logs & grading them according to quality
			5-0	Miners & Quarrymen
			5-1	Well Diggers & Related Workers
			5-2	Mineral Treaters
			5-99.70	Sampler, Mine
			5-99.80	Crude Oil Treater
			5-99.90	Miners, Quarrymen & Related Workers N.E.C., Other LESS: those loading cars with loose material & pushing them along haulage ways
			7-99.75	Well Digger
076	Farm & Garden Wkr	Farm & Garden Worker	4-11	Farm Workers N.E.C. LESS: 4-11.45 Operator, Farm Equipment (Motor Driven) (see Construction Equipment Operator 171); 4-11.75 Farm Laborer (see Laborers 205)

077	Fisherman & Hunter	Fisherman & Hunter	4-21	Hunters & Related Workers LESS: those doing laborers' work (see Laborers 205)
			4-31	Fishermen & Related Workers LESS: 4-31.70 Fish Hatcher (see Other Technicians N.E.C. 050); 4-31.80 Oyster Culturist (see Other Extractive Workers 082), those doing laborers' work (see Labor 205)
078	Forester & Logger	Forester & Logger	4-41	Loggers & Other Forestry Workers LESS: 4-41.15 Cruiser, Timber (see Other Technician N.E.C. 050); part of 4-41.90 those loading logs into chutes & stacking logs preparatory to transport (see Laborers 205); part of 4-41.90 those hauling or snigging logs in forest to truck to loading platforms (see Other Transportation Worker 190), part of 4-41.90 those examining logs & grading them according to quality (see Inspector & Grader 074), those doing Laborers' work (see Laborers 205)
079	Well Driller	Well Driller	5-11	Well Drillers & Relater Workers LESS: those doing Laborer's work (see Laborers 205)
			7-99.75	Well Digger
080	Miner & Quarryman	Miner & Quarryman	5-01	Miners & Quarrymen LESS: those doing Laborer's work (see Laborers 205)
081	Mineral Treater	Mineral Treater	5-21	Mineral Treaters LESS: those doing Laborer's work (see Laborers 205)
082	Other	Other Extractive Worker	4-31.80	Oyster Culturist
			5-99.70	Sampler, Mine
			5-99.80	Crude Oil Treater
			5-99.90	Miners, Quarrymen & Related Workers N.E.C., Other LESS: those loading cars with loose material & pushing them along haulage ways; those doing Laborer's work (see Laborers 205)

083	Food & Bev Wkrs	Food & Beverage Workers	8-2 Part of 8-31.90 Part of 8-32.15 8-39.60 8-39.65	Millers, Bakers, Brewmasters & Related Food & Beverage Workers LESS: 8-29.15 Taster, Coffee or Tea; 8-29.20 Taster, Wine or Liquor Those distilling alcoholic beverages from prepared mixtures Those cooking organic materials such as fats & molasses Carbonation Man, Sugar Refining Crystallizer Operator, Sugar Refining
084	Miller	Miller	8-21	Millers, Grain & Related Products
085	Baker	Baker	8-22	Bakers & Pastry Cooks
086	Dairy Wkr	Dairy Worker	8-27	Dairy Workers
087	Brewery Wkr	Brewery & Other Beverage Worker	8-24 Part of 8-31.90	Brewers, Winemakers & Related Workers Those distilling alcoholic beverages from prepared mixtures
088	Butcher & Meat Wkr	Butcher & Meat Processing Worker	8-26	Butchers & Meat Cutters
089	Canner & Presvr	Canner & Preserver	8-25	Curers, Freezers, Cooks & Related Canners & Preservers
090	Other	Other Food & Beverage Worker	8-23 8-29 Part of 8-32.15	Sugar & Chocolate Confectionary Workers Food Processor N.E.C. LESS: 8-29.15 Taster, Coffee or Tea; 8-29.20 Taster, Wine or Liquor (see Other Professional & Technical Workers 053) Those cooking organic materials such as fats & molasses

090 Other (Con't.)	Other Food & Beverage Worker	8-39.60	Carbonation Man, Sugar Refining
		8-39.65	Crystallizer Operator, Sugar Refining
091 Tobacco Wkrs	Tobacco & Tobacco Product Workers	8-41	Tobacco Preparers LESS: 8-41.20 Grader (Tobacco) (see Inspector & Grader 074)
		8-42	Cigar Makers LESS: part of 8-42.90 those examining wrapper leaves & sorting them for color & size, those examining finished cigars for imperfections & sorting for color & size (see Inspector & Grader 074)
		8-43	Cigarette Makers LESS: part of 8-43.90 those examining cigarettes for proper filling, printing, gluing; those checking weight of cigarettes & measuring their length in guage (see Inspector & Grader 074)
		8-49	Tobacco-Product Makers N.E.C.
092 Textile Wkrs	Textile Workers	7-0	Spinners, Weavers, Knitters, Dyers & Related Workers LESS: 7-01.15 Grader & Classer, Fibre Wool Sorter; part of 7-06.90 those pressing made-up goods; 7-09.15 examiner, fabrics; 7-09.50 fur-fibre-mixing-machine operator; 7-09.55 Former (Fur Felt Hoods); 7-09.60 Former (Wool Felt Hoods); part of 7-09.90 those hardening & shrinking hat forms
		7-59.65	Card Grinder, Textile
		8-59.60	Linoleum Maker
		Part of 8-59.90	Those waterproofing textiles with oil
093 Fibre Preparer	Fibre Preparer	7-01	Fibre Preparers LESS: 7-01.15 Grader & Classer, Fibre Wool Sorter (see Inspector & Grader 074)
094 Spinner & Winder	Spinner & Winder	7-02	Spinners & Winders, Textile

095	Weaver & Loom Fix	Weaver & Loom Fixer	7-03	Weavers, Loom Fixers & Loom Preparers LESS: 7-03.15 Beam Warper; 7-03.35 Tapestry Maker, Hand; 7-03.50 Weaver (Lace) Machine (see Other Textile Workers 098)
096	Knitter	Knitter	7-04	Knitters, & Knitting Machine Setters
097	Bleacher & Dyer	Bleacher, Dyer & Finisher	7-06	Bleachers, Dyers & Finishers of Textiles LESS: part of 7-06.90 those sizing the warp (see Other Textile Worker 098); part of 7-06.90 those pressing made-up goods (see Other Clothing & Related Worker 104)
098	Other	Other Textile Worker	7-03.15	Beam Warper
			7-03.35	Tapestry Maker, Hand
			7-03.50	Weaver (Lace) Machine
			7-05	Pattern-Card Preparers
			Part of 7-06.90	Those sizing the warp
			7-09	Textile Fabric & Related Product Workers N.E.C. LESS: 7-09.15 Examiner, Fabrics (see Inspector & Grader 074) 7-09.50 Fur-Fibre-Mixing-Machine Operator (see Furrier 103) 7-09.55 Former (Fur Felt Hoods) (see Milliner & Hat Maker 102) 7-09.60 Former (Wool Felt Hoods) (see Milliner & Hat Maker 102), part of 7-09.90 those hardening & shrinking hat forms (see Milliner & Hat Maker 102)
			7-59.65	Card Grinder, Textile
			8-59.60	Linoleum Maker
			Part of 8-59.90	Those waterproofing textiles with oil

099	Clothing & Rel Wkrs	Clothing & Related Workers	7-1	Tailors, Cutters, Furriers & Related Workers LESS: 7-14 Upholsterers & Related Workers, except part of 7-14.90 those cutting out or completely working curtains, pelmets & furniture covers; part of 7-16.90 those sewing upholstery; part of 7-19.90 those making artifical flowers, those making decorative trimmings with feathers
			Part of 7-06.90	Those pressing made-up goods
			7-09.50	Fur-Fibre-Mixing Machine Operator
			7-09.55	Former (Fur Felt Hoods)
			7-09.60	Former (Wool Felt Hoods)
			Part of 7-09.90	Those hardening & shrinking hat forms
			7-22.15	Pattern maker (Footwear)
			7-22.25	Clicker Cutter, Hand
			7-29.20	Leather Cutter (except Footwear, Gloves & Garments)
100	Cutter	Cutter	7-15	Patternmakers, Markers & Cutters (Textile Products, Leather Garments & Gloves)
			7-22.15	Patternmaker (Footwear)
			7-22.25	Clicker Cutter, Hand
			7-29.20	Leather Cutter (except Footwear, Gloves & Garments)
101	Tailor & Dressmkr	Tailor & Dressmaker	7-11	Tailors, Dressmaker & Garment Makers LESS: part of 7-11.90 those making corsetry completely (see Other Clothing & Related Worker 104)
102	Milliner & Hat Mkr	Milliner & Hat Maker	7-09.55	Former (Fur Felt Hoods)
			7-09.60	Former (Wool Felt Hoods)
			Part of 7-09.90	Those hardening & shrinking hat forms
			7-13	Milliners & Hatmakers
			Part of 7-19.90	Those shaping hats by hand or machine

103	Furrier	Furrier	7-09.50	Fur-Fibre-Mixing-Machine Operator
			7-12	Fur Tailors & Related Workers
104	Other	Other Clothing & Related Worker	Part of 7-06.90	Those pressing made-up goods
			Part of 7-11.90	Those making corsetry completely
			Part of 7-14.90	Those cutting out or completely making curtains, pelmets & furniture covers
			7-16	Sewers & Embroiders (Textile and Fur Products, Leather Garments & Gloves) LESS: part of 7-16.90 those sewing upholstery (see Upholsterers & Related Worker 113)
			7-19	Apparel & Related Product Makers N.E.C. LESS: part of 7-19.90 those shaping hats by hand or machine (see Milliner & Hat Maker 102); part of 7-19.90 those making artificial flowers, those making decorative trimmings with feathers (see Miscellaneous Product Workers 163)
105	Shoe Wkrs	Shoe Workers	7-21	Shoemakers & Shoe Repairers
			7-22	Cutters, Lasters, Sewers (Footwear) & Related Workers LESS: 7-22.15 Patternmaker (Footwear) 7-22.25 Clicker Cutter, Hand
106	Shoemkr, Non-fact	Shoemaker, Nonfactory	7-21	Shoemakers & Shoe Repairers
107	Other	Other Shoe Worker	7-22	Cutters, Lasters, Sewers (Footwear) & Related Workers LESS: 7-22.15 Patternmaker (Footwear); 7-22.25 Clicker Cutter, Hand (see Cutter 100)
108	Wood & Furn Wkrs	Wood & Furniture Workers	7-14	Upholsterers & Related Workers LESS: part of 7-14.90 those cutting out or making completely curtains, pelmets & furniture covers

108	Wood & Furn Wkrs (Con't)	Wood & Furniture Workers	Part of 7-16.90	Those hand-sewing upholstery
			7-72	Cabinetmakers
			7-73	Sawyers & Woodworking-Machine Setters & Operators
			7-79	Woodworkers N.E.C. LESS: 7-79.30 Grader, Wood; 7-79.50 Patternmaker, Wood; 7-79.61 Wooden-Model Maker
			8-51.30	Wicker-Furniture Maker
			Part of 8-59.90	Those operating machine which cuts square sections of natural cork to produce corks of required size & taper
109	Sawyer	Sawyer	7-73.15	Sawyer, Wood, Precision
			7-73.20	Sawyer, General, Sawmill
			7-73.25	Head Sawyer, Sawmill
			7-73.30	Edge Sawyer, Sawmill
			7-73.35	Veneer Cutter
110	Turner & Mach Opr	Turner & Woodworking Machine Operator & Setter	7-73.40	Woodworking-Machine Setter, General
			7-73.45	Woodworking-Machine Setter-Operator, General
			7-73.50	Planning-Machine Setter-Operator, Woodworking
			7-73.55	Shaping-Machine Setter-Operator, Woodworking
			7-73.60	Routing-Machine Setter-Operator, Woodworking
			7-73.65	Lathe Setter-Operator, Woodworking
			7-73.70	Spindle-Carving-Machine Setter-Operator, Woodworking
			7-73.75	Woodworking-Machine Operator, General
			7-73.90	Sawyers & Woodworking-Machine Setters & Operators, Other
			7-79.55	Turner, Wood
			7-79.58	Marker, Woodworking
111	Cooper	Cooper	7-79.73	Cooper
			7-79.76	Wooden-Tank Maker
112	Cabinetmaker	Cabinetmaker	7-72	Cabinetmakers

113	Upholst & Rel Wkr	Upholsterer & Related Furniture Worker	Part of 7-16.90	Those hand-sewing upholstery
			7-14	Upholsterers & Related Workers LESS: part of 7-14.90 those cutting out or making completely curtains, pelmets & furniture covers (see Other Clothing & Related Worker 104)
114	Other	Other Wood & Furniture Worker	7-79.15	Coach-Body Builder, Wood
			7-79.20	Cartwright, Wood
			7-79.25	Wheelwright, Wood
			7-79.35	Bender, Wood
			7-79.40	Seasoner, Wood
			7-79.45	Impregnator, Wood
			7-79.67	Smoking-Pipe Maker
			7-79.70	Sporting Equipment Maker
			7-79.79	Marquetry Inlayer
			7-79.82	Veneer Applier
			7-79.85	Carver, Wood
			7-79.88	Furniture Finisher, Wood
			7-79.90	Woodworkers N.E.C., Other
			8-51.30	Wicker-Furniture Maker
			Part of 8-59.90	Those operating machine which cut square sections of natural cork to produce corks of required size & taper
115	Pulp & Paper Wkrs	Pulp, Paper & Paper Products Workers	8-34	Paper-Pulp Preparers
			8-35	Paper Makers
			8-38	Paper-Product Makers
			Part of 8-59.90	Those treating & coating paper or paper felt with tar or asphalt
116	Print & Publish Wkrs	Printing & Pbulishing Workers	8-0	Compositors, Pressmen, Engravers, Bookbinders & Related Workers
117	Compositor	Compositor & typesetter	8-01	Compositors & Typesetters

118	Pressman & Printer	Pressman & Printer	8-02	Pressmen, Printing
119	Photoengrv & Litho	Photoengraver & Lithographer	8-04.15	Engraver (Lithographic Stone)
			8-04.45	Transferrer, Direct Lithographic
			8-05	Photo-Engraver
120	Other Engraver	Other Engraver	8-04	Engravers, Printing (except Photoengravers LESS: 8-04.15 Engraver (Lithographic Stone) 8-04.45 Transferrer, Direct Lithographic (see Photoengraver & Lithographer 119)
121	Bookbinder	Bookbinder	8-06	Bookbinders & Related Workers LESS: part of 8-06.90 those performing other bookbinding operations (see Other Printing & Publishing Worker 122)
122	Other	Other Printing & Publishing Worker	8-03	Stereotypers & Electrotypers
			Part of 8-06.90	Those performing other bookbinding operations
			8-09	Printing Workers N.E.C.
123	Leather Wkrs	Leather Workers	7-23	Harness & Saddle Makers
			7-29	Leather-Product Makers N.E.C. LESS: 7-29.20 Leather Cutter (except Footwear, Gloves & Garments)
			8-54	Tanners, Fellmongers, Pelt Dressers & Related Workers LESS: 8-54.20 Hide & Skin Grader, 8-54.65 Pelt Grader
124	Tanner & Hide Prep	Tanner & Hide Preparer	8-54	Tanners, Fellmongers, Pelt Dressers & Related Workers LESS: 8-54.20 Hide & Skin Grader, 8-54.65 Pelt Grader (see Inspector & Grader 074)
125	Other	Other Leather Worker	7-23	Harness & Saddle Makers
			7-29	Leather-Product Makers N.E.C. LESS: 7-29.20 Leather Cutter (except Footwear, Gloves

125	Other (Con't.)	Other Leather Worker		& Garments) (see Cutter 100)
126	Tire & Ruber Wkrs	Tire & Rubber Workers	8-33.40	Millman, Rubber
			8-33.60	Calender-Machine Operator, Rubber
			8-52	Tyre Builders, Vulcanisers & Related Rubber-Product Makers
127	Chemical Wkrs	Chemical Workers	8-31	Batch & Continuous-Still Operators LESS: part of 8-31.90 those distilling alcoholic beverages from prepared mixtures (see Brewery & Other Beverage Worker 087)
			8-32	Cookers, Roasters & Other Heat Treaters, Chemical & Related Processes LESS: part of 8-32.15 those cooking organic materials such as fats & molasses in open vats, boiling pans, kettles or similar containers (see Other Food & Beverage Worker 090); part of 8-32.20 those heating substances such as limestone & gypsum in oven, kiln or similar device (see Kiln Worker 130); 8-32.35 Furnaceman, Cement (see Kiln Worker 130); 8-32.45 Oven Tender, Paint Drying (see Kiln Worker 130); 8-32.50 Coke Curner (see Furnaceman & Smelter 148)
			8-33	Crushers, Millers & Calenderers, Chemical & Related Processes LESS: 8-33.40 Millman, Rubber; 8-33.60 Calender-Machine Operator, Rubber (see Tire & Rubber Workers 126)
			8-39	Chemical & Related Process Workers N.E.C. LESS: 8-39.60 Carbonation Man, Sugar Refining; 8-39.65 Crystallizer Operator, Sugar Refining (see Other Food & Beverage Worker 090)
			8-59.45	Candle Maker, Candle Dipper, Candle Moulder
			8-59.65	Match Maker

128	Glass & Clay Wkrs	Glass & Clay Workers	8-1	Potters, Kilnmen, Glass & Clay Formers & Related Workers LESS: 8-11.30 Moulder, Glass, Lenses; 8-11.55 Cutter, Optical Glass; 8-11.60 Grinder, Precision (Optical Elements); 8-11.65 Polisher, Precision (Optical Elements); 8-11.70 Beveler, Optical Elements; 8-11.75 Lens-Grinding-Machine Operator; 8-11.80 Lens-Polishing-Machine Operator; part of 8-11.90 those mounting lens blanks in blocks prior to grinding, & those cementing lens elements together to obtain corrected lens assembles
			Part of 8-32.20	Those heating substances such as limestone & gypsum in oven, kiln or similar device
			8-32.35	Furnaceman, Cement
			8-32.45	Oven Tender, Paint Drying
			8-59.15	Abrasive-Coated Cloth & Paper Maker
129	Decorator	Glass & Ceramics Decorator	8-14	Decorators, Glass & Ceramics
130	Kiln Wkr	Kiln Worker	8-13	Furnacemen & Kilnmen, Glass & Ceramics
			Part of 8-32.20	Those heating substances such as limestone & gypsum in oven, kiln or similar device
			8-32.35	Furnaceman, Cement
			8-32.45	Oven Tender, Paint Drying
131	Glass Maker	Glass Maker	8-11.15	Blower, Glass (except Laboratory Apparatus)
			8-11.20	Blower, Glass (Laboratory Apparatus)
			8-11.25	Bender, Glass Tube
			8-11.35	Presser (Glass) Hand
			8-11.40	Blowing-Machine Operator, Glass
			8-11.45	Drawing-Machine Operator, Flat Glass
			8-11.50	Pressing-Machine Operator, Glass
			8-11.85	Mirror Silverer
			8-11.90	Glass Formers, Cutters, Grinders & Finishers, Other

131	Glass Maker (Con't.)	Glass Maker		LESS: those mounting lens blanks in blocks prior to grinding, those cementing lens elements together to obtain corrected lens assembles (see Optician & Optical Worker 155)
			Part of 8-19.90	Those tending machines for crushing & washing scrap glass
132	Clay & Ceramic Wkr	Clay & Ceramic Worker	8-12	Potters & Related Clay & Abrasive Formers
			8-19	Glass & Ceramics Workers N.E.C. LESS: part of 8-19.90 those tending machines for crushing & washing scrap glass (see Glass Maker 131)
133	Other	Other Glass & Clay Worker	8-59.15	Abrasive-Coated Cloth & Paper Maker
134	Stone Cut & Carvers	Stone Cutters & Carvers	8-57	Stone Cutters & Carvers LESS: 8-57.15 Grader (Stone) (see Inspector & Grader 074)
135	Metal Fabr & Makers	Metal Fabricators & Makers	7-3	Furnacemen, Rollers, Drawers, Moulders & Related Metal Making & Treating Workers
			7-5	Toolmakers, Machinists, Plumbers, Welders, Platers & Related Workers LESS: 7-52 Fitter-Assemblers & Machine Erectors (except Electrical & Precision Instrument Fitter-Assemblers, except for 7-52.70 Erector & Installer, Machinery; & part of 7-52.90 those erecting particular types of machinery & equipment not specifically mentioned elsewhere in this unit group; 7-53 Machanics-Repairmen (except Electrical & Precision-Instrument Repairmen); part of 7-54.10 Roofer (Metal); 7-55 Plumbers & Pipe Fitters, except for 7-55.80 Lead Burner; 7-59.15 Gunsmith; 7-59.20 Locksmith; 7-59.25 Assembler, Metal Products; 7-59.65 Card Grinder, Textile;

135	Metal Fabr & Makers (Con't.)	Metal Fabricators & Makers	7-79.50 7-79.61 8-32.50	Patternmaker, Wood Wooden-Model Maker Coke Burner
136	Molder & Coremkr	Moulder & Coremaker	7-35	Moulders & Coremakers LESS: part of 7-35.90 those pouring molten metal into moulds, those baking or drying moulds & cones in ovens or heated chambers (see Other Metal Fabricators & Maker 152)
137	Patternmaker	Patternmaker	7-79.50 7-79.61	Patternmaker, Wood Wooden-Model Maker
138	Tool & Die Mkr	Tool & Die Maker	7-50.15 7-50.20 7-50.25	Toolmaker Die Maker Patternmaker (Metal) Foundry
139	Mach & Tool Setter	Machinist & Machine Tool Setter	7-50	Fitter-Machinists, Toolmakers & Machine-Tool Setters LESS: 7-50.15 Toolmaker; 7-50.20 Die Maker; 7-50.25 Patternmaker (Metal), Foundry (see Tool & Die Maker 138)
140	Machine-Tool Oper	Machine Tool Operator	7-51 7-59.30	Machine-Tool Operators Metal Spinner
141	Sheetmetal Wkr	Sheetmetal Worker	7-54	Sheetmetal Workers LESS: part of 7-54.10 Roofer (Metal), (see Other Construction Worker 172)
142	Mach Fit & Erect	Machine Fitter & Erector	7-52.70 Part of 7-52.90	Erector & Installer, Machinery Those erecting particular types of machinery & equipment not specifically mentioned elsewhere in this unit group

143	Struct & Plate Wkr	Structural Steel & Metal Plate Worker	7-57	Metal-Plate & Structural-Metal Worker
144	Smith & Hammerman	Blacksmith & Hammerman	7-34	Blacksmiths, Hammerman & Forgemen
145	Welder & Flame Cut	Welder & Flame Cutter	7-55.80 7-56 7-59.70	Lead Burner Welders & Flame Cutters Solderer, Hand
146	Heat Treater	Heat Treater & Temperer	7-32	Annealers, Temperers & Related Heat Treaters
147	Plater	Electrical & Other Plater	7-58	Electro-Platers, Dip Platers & Related Workers
148	Furnace & Smelter	Furnaceman & Smelter	7-31 8-32.50	Furnaceman, Metal Coke Burner
149	Roller	Roller & Rolling Mill Operator	7-33	Rolling-Mill Operators, Metal
150	File, Grd, Polish	Filer, Grinder & Polisher	7-39.20 7-39.30 7-59.45 7-59.50 7-59.55 7-59.60 Part of 7-59.90	Sandblaster, Metal Metal Dresser Buffing & Polishing Machine Operator, Metal Working Tool Grinder, Machine Tools Cutlery & Tool Grinder (except Machine Tools) Saw Repairman & Sharpener Those Polishing & Burnishing metal by hand
151	Drawer & Extruder	Drawer & Extruder	7-36	Metal Drawers & Extruders

152 Other	Other Metal Fabricator & Maker	Part of 7-35.90	Those pouring molten metal into moulds, those baking or drying moulds & cores in ovens or heated chambers.
		7-39.90	Metal Making & Treating Workers N.E.C., Other
		7-59.35	Power-Press Operator, Metal Working
		7-59.40	Metal-Sawing-Machine Operator
		7-59.90	Metal Workers N.E.C., Other LESS: those polishing & burnishing metal by hand (see Filer, Grinder & Polisher 150)
153 Electrical Prod Mkrs	Electrical Product Makers	7-69.90	Electrical & Electronics Workers N.E.C., Other
		8-59.83	Coil Winder, Machine
		8-59.86	Coil Winder, Hand
154 Instr Mkr & Jewelers	Instrument Makers & Jewelers	7-4	Precision-Instrument Makers, Watchmakers, Jewelers & Related Workers LESS: 7-41.40 Maker & Repairman, Orthopaedic Appliances; 7-41.45 Maker & Repairmen, Dental Prosthesis; part of 7-42.90 those making or repairing imitation jewelery
		8-11	Glass Formers, Cutters, Grinders & Finishers LESS: 8-11.15 Blower, Glass (except Laboratory Apparatus); 8-11.20 Blower, Glass (Laboratory Apparatus); 8-11.25 Bender, Glass Tube; 8-11.35 Presser (Glass), Hand; 8-11.40 Blowing-Machine Operator, Glass; 8-11.45 Drawing-Machine Operator, Flat Glass; 8-11.50 Pressing-Machine Operator Glass; 8-11.85 Mirror Silverer; part of 8-11.90 those ladling molten glass into moulds, shearing off excess amounts of molten glass from edges of moulds, gathering required amounts of molten glass on the end of a metal rod & handing it to other workers, bevelling & polishing plate on sheet glass, drilling holes in glass, making glass tubing by hand or machine
		8-56	Makers of Musical Instruments & Related Workers
		8-59.75	Photographic Film & Paper Maker
		Part of 8-59.90	Those operating machines for coating, backing & cutting photographic plates

155	Optician & Opt Wkr	Optician & Optical Worker	7-41.30 7-41.35 8-11.30 8-11.55 8-11.60 8-11.65 8-11.70 8-11.75 8-11.80 Part of 8-11.90	Maker & Repairman, Optical Instruments Optician Moulder, Glass, Lenses Cutter, Optical Glass Grinder, Precision (Optical Elements) Polisher, Precision (Optical Elements) Beveller, Optical Elements Lens-Grinding-Machine Operator Lens-Polishing-Machine Operator Those mounting lens blanks in blocks prior to grinding, & those cementing lens elements together to obtain corrected lens assembles
156	Instrument Mkr	Instrument Maker	7-41.25 7-41.50 7-41.55 7-41.60 Part of 7-41.90	Maker & Repairman, Precision Instruments Fitter-Assembler, Precision Instruments Assembler, Precision Instruments Serviceman, Precision Instruments Precision-instrument maker & repairman n.e.c.
157	Watch Mkr & Repair	Watch Maker & Repairman	7-41.15 7-41.20 Part of 7-41.90	Watch & Clock Maker Watch & Clock Repairer Watch & clock makers & repairmen n.e.c.
158	Jeweler	Jeweler	7-42 7-43	Jewellers, Goldsmith & Silversmiths LESS: part of 7-42.90 those making or repairing imitation jewelery (see Miscellaneous Product Workers 163) Jewellery Engravers
159	Muscial Instr Mkr	Musical Instrument Maker	8-56	Makers of Musical Instruments & Related Workers

160	Other	Other Instrument Maker & Jeweler	8-59.75	Photographic Film & Paper Maker
			Part of 8-59.90	Those operating machines for coating, backing & cutting photographic plates
161	Plastic Goods Makers	Plastic Goods Makers	8-53	Plastics-Product Makers
162	Photo Process Wkrs	Photographic Process Workers	8-55	Photographic Dark-Room Workers
163	Miscel Product Wkrs	Miscellaneous Product Workers	Part of 7-19.90	Those making artifical flowers, those making decorative trimmings with feathers
			Part of 7-42.90	Those making or repairing imitation jewelery
			8-51.20	Basket Maker
			8-51.90	Basketry Weavers & Related Workers, Other
			8-59.20	Artifical-Stone Maker
			8-59.25	Artifical-Tooth Maker
			8-59.30	Broom Maker
			8-59.35	Brush Maker, Hand
			8-59.40	Button Maker
			8-59.55	Doll Maker
			8-59.70	Pencil Maker
			8-59.80	Rubber Stamp Maker
			8-59.90	Miscellaneous Craftsmen & Production-Process Workers N.E.C., Other LESS: those operating machine which cuts square sections of natural cork to produce corks of required size & taper (see Other Wood & Furniture Worker 114); those operating machines for coating, backing, & cutting photographic plates (see Other Instrument Maker & Jeweler 160); those treating & coating paper or paper felt with tar or asphalt (see Pulp, Paper & Paper-Products Worker 115); those waterproofing textiles with oil (see Other Textile Worker 098)

164	Construction Wkrs	Construction Workers	4-11.45	Operator, Farm Equipment (Motor Driven)
			Part of 7-54.10	Roofer (Metal)
			7-55	Plumbers & Pipe Fitters LESS: 7-55.80 Lead Burners
			7-61	Electricians, Electrical Repairmen & Related Electrical Workers LESS: 7-61.30 Electrician (Vehicles); 7-61.45 Electrical Repairman; 7-61.50 Electrical Load Despatcher, Power Station; 7-61.55 Electrical Switchboard Operator, Power Station
			7-71	Carpenters & Joiners
			7-81	Painters & Paperhangers, Construction & Maintenance
			7-9	Bricklayers, Plasterers & Construction Workers N.E.C. LESS: 7-99.75 Well Diggers
			8-74	Operators of Earth-Moving & Other Construction Machinery N.E.C.
165	Carpenter & Joiner	Carpenter & Joiner	7-71	Carpenters & Joiners LESS: 7-71.55 Roofer (Wooden Shingles) (see Other Construction Worker 172)
166	Painter & Paper	Painter & Paperhanger	7-81	Painters & Paperhangers, Construction & Maintenance
167	Bricklayer & Mason	Bricklayer, Stonemason & Tile Setters	7-91	Bricklayers, Stonemasons & Tile Setters
168	Electrician	Electrician	7-61	Electricians, Electrical Repairmen & Related Electrical Workers LESS: 7-61.30 Electrician (Vehicles) (see Other Mechanic & Repairman 194); 7-61.45 Electrical Repairman (see Radio & Electric Appliance Repairman 193); 7-61.50 Electrical Load Despatcher, Power Station (see Other Electric Power, Telephone & Telegraph Worker 176); 7-61.55 Electrical Switchboard Operator, Power Station (see Other Electric Power, Telephone & Telegraph Worker 176)

169	Plumber & Fitter	Plumber & Pipe Fitter	7-55	Plumbers & Pipe Fitters LESS: 7-55.80 Lead Burner (see Welder & Flame Cutter 145); part of 7-55.90 those installing hangers & brackets for supporting pipelines (see Other Construction Worker 172)
170	Other Constr Craft	Other Construction Craftsman	7-92	Plasterers
			7-93	Cement Finisher & Terrazzo Workers
			7-94	Insulation Appliers
			7-95	Glaziers
			7-99.10	Housebuilder, General
			7-99.15	Floor-Layer (Mastic Composition)
			7-99.20	Floor-Layer (Composition Tile)
			7-99.45	Building Maintenance Man
			7-99.50	Steeplejack
			7-99.70	Diver
			7-99.85	Scaffolding Erector, Metal or Wood
171	Constr Equip Oper	Construction Equipment Operator	4-11.45	Operator, Farm Equipment (Motor Driven)
			8-74	Operators of Earth-Moving & Other Construction Machinery N.E.C.
172	Other Constr Wkr	Other Construction Worker	Part of 7-54.10	Roofer (Metal)
			Part of 7-55.90	Those installing hangers & brackets for supporting pipe lines.
			7-71.55	Roofer (Wooden Shingles)
			7-99.25	Roofer (Slate, Tile & Similar Materials)
			7-99.30	Roofer (Composition)
			7-99.35	Roofer (Asphalt & Similar Materials)
			7-99.40	Roof Thatcher
			7-99.55	Sandblaster, Building Exteriors
			7-99.60	Steam Cleaner, Building Exteriors
			7-99.65	Paver
			7-99.80	Pipe Layer
			7-99.90	Construction Workers N.E.C., Other

173	Elect Pow & Tel Wkrs	Electric Power, Telephone & Telegraph Workers	7-61.50	Electrical Load Despatcher, Power Station
			7-61.55	Electrical Switchboard Operator, Power Station
			7-64	Installers & Repairmen, Telephone & Telegraph
			7-65	Linemen & Cable Jointers
174	Lineman	Lineman & Cable Jointer	7-65	Linemen & Cable Jointers
175	Tel Instal & Repr	Telephone Installer & Repairman	7-64	Installers & Repairmen, Telephone & Telegraph
176	Other	Other Electric Power Telephone & Telegraph Worker	7-61.50	Electrical Load Despatcher, Power Station
			7-61.55	Electrical Switchboard Operator, Power Station
177	Transportation Wkrs	Transportation Workers	Part of 4-41.90	Those hauling or snigging logs in forest to truck loading platform
			5-99.20	Engine Driver, Mine & Quarry
			5-99.30	Shuttle-Car Operator, Mine
			5-99.50	Brakeman (Mine & Quarry)
			6-1	Deck & Engine-Room Ratings (Ship) Barge Crews & Boatmen LESS: 6-12.40 Oiler & Greaser (Ship)
			6-3	Drivers & Firemen, Railway Engine
			6-4	Drivers of Motorized Vehicles
			6-51.20	Brakeman (Railway)
			6-62.40	Railway Signalman
			6-62.50	Railway Shunter
			6-91	Conductors, Road Transport
			6-92	Workers In Transport Occupations N.E.C. LESS: part of 6-92.90 those selling tickets on means of transportation other than bus or train
			6-94	Workers in Communication Occupations N.E.C.
			8-81.20	Longshoreman
			8-81.30	Boat Loader (Petroleum)

178	Loco Engr & Fm	Locomotive Engineer & Fireman	5-99.20 6-31	Engine Driver, Mine & Quarry Drivers & Firemen, Railway Engine LESS: 6-31.70 Driver, Underground or Elevated Train (see Motorman 188)
179	Railway Brakeman	Railway Brakeman	5-99.50 6-51.20 6-62.50	Brakeman (Mine & Quarry) Brakeman (Railway) Railway Shunter
180	Signalman	Railway Signalman	6-62.40	Railway Signalman
181	Seaman & Boatman	Seaman & Boatman	6-11	Deck Ratimgs (Ship), Barge Crews & Boatmen
182	Engine-Room Rating	Engine-Room Rating	6-12	Engine-Room Ratings, Firemem & Oilers (Ship) LESS: 6-12.40 Oiler & Greaser (Ship) (see Oiler & Greaser 201)
183	Dockworker	Dockworker	8-81.20 8-81.30	Longshoreman Boat Loader (Petroleum)
184	Other Maritime Wkr	Other Maritime Worker	6-92 6-94.90	Workers in Transport Occupations N.E.C. LESS: part of 6-92.90 those selling tickets on means of transportation other than bus or train (see Bookkeepers, Cashiers & Tellers 060) Workers in Communication Occupation N.E.C., Other
185	Truck Driver	Truck Driver	6-41.40 6-41.50	Lorry & Van Driver (Heavy) Lorry & Van Driver (Light)
186	Bus Driver	Bus Driver	6-41.30	Motor Bus Driver

187	Other Motor Veh Dr	Other Motor Vehicle Driver	6-41.20 6-41.60 6-41.90	Motor Car Driver Motor Cyclist Drivers of Motorized Vehicles, Other
188	Motorman	Motorman	5-99.30 6-31.70 6-41.15	Shuttle-Car Operator, Mine Driver, Underground or Elevated Train Train Driver
189	Transit Conductor	Transit Conductor	6-91.10	Conductor (Bus or Train)
190	Other	Other Transportation Worker	Part of 4-41.90	Those hauling or snigging logs in forest to truck loading platform
191	Mech & Repairmen	Mechanic & Repairmen	7-53 7-59.15 7-59.20 7-61.30 7-61.45 7-63	Mechanics-Repairmen (except Electrical & Precision-Instrument Repairmen) Gunsmith Locksmith Electrician (Vehicles) Electrical Repairman Mechanics-Reapirmen, Radio & Television
192	Auto Mech	Automobile Mechanic	7-53.70 7-53.75	Mechanic-Repairman (Motor Cycles & Motorized Pedal Cycles) Mechanic-Repairman (Motor Vehicles)
193	Radio & Appl Repr	Radio & Electric Appliance Reapirman	7-61.45 7-63	Electrical Repairman Mechanics-Repairmen, Radio & Television
194	Other	Other Mechanic & Repairman	7-53	Mechanics-Repairmen (except Electrical & Precision-Instrument Repairmen LESS: 7-53.70 Mechanic-Repairman (Motor Cycles & Motorized Pedal Cycles); 7-53.75 Mechanic-Repairman (Motor Vehicles) (see Automobile Mechanic 192)

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194	Other (Con't.)	Other Mechanic & Repairman	7-59.15	Gunsmith
			7-59.20	Locksmith
			7-61.30	Electrician (Vehicles)
195	Hoist & Lift Opers	Hoist & Lift Operators	5-99.60	Cageman, Mine
			8-72	Crane & Hoist Operators
			8-73	Riggers & Cable Splicers
196	Crane & Hoist Oper	Crane & Hoist Operator	5-99.60	Cageman, Mine
			8-72	Crane & Hoist Operators
197	Rigger	Rigger	8-73	Riggers & Cable Splicers
198	Stat Engrs & Fm	Stationary Engineers & Firemen	6-12.40	Oilers & Greasers (Ship)
			8-71	Operators of Stationary Engines & Related Equipment & Boiler Firemen
			8-76	Oilers & Greasers (Stationary Engines, Motor Vehicles & Related Equipment)
199	Stationary Engr	Stationary Engineer	8-71	Operators of Stationary Engines & Related Equipment & Boiler Firemen LESS: 8-71.80 Fireman (Steam Boiler), part of 8-71.90 those tending boilers in hot water systems (see Boiler Fireman, Ashore 200)
200	Boiler Fm, Ashore	Boiler Fireman, Ashore	8-71.80	Fireman (Steam Boiler)
			Part of 8-71.90	Those tending boilers in hot water systems
201	Oiler & Greaser	Oiler & Greaser	6-12.40	Oiler & Greaser (Ship)
			8-76	Oilers & Greasers (Stationary Engines, Motor Vehicles & Related Equipment)
202	Fitter-Assemblers	Fitter-Assemblers	7-52	Fitter-Assemblers & Machine Erectors (except Electrical &

202	Fitter-Assemblers (Con't.)	Fitter-Assemblers		Precision-Instrument Fitter-Assemblers) LESS: 7-52.70 Erector& Installer, Machinery; part of 7-52.90 those erecting particular types of machinery & equipment not specifically mentioned elsewhere in this unit group (see Machine Fitter & Erector 142)
			7-62	Electrical & Electronic Fitters
203	Assemblers	Assemblers	7-59.25	Assembler, Metal Products
			7-69.20	Assembler, (Electrical Equipment)
			7-69.30	Assembler, (Electronic Equipment)
204	Apprentices	Apprentices		
205	Laborers	Laborers	4-11.75	Farm Laborer
			Part of 4-2	Those doing Laborer's Work
			Part of 4-3	Those doing Laborer's Work
			Part of 4-4	Those doing Laborer's Work
			Part of 4-41.90	Those loading logs into chutes & stacking logs preparatory to transport
			Part of 5	Those doing Laborer's Work
			5-99.40	Driver, Animal-Drawn Vehicle (Mine & Quarry)
			Part of 5-99.90	Those loading cars with loose material & pushing them along haulage ways
			6-42	Drivers of Animals & Animal-Drawn Vehicles
			6-43	Drivers Propelling Their Vehicles
			8-81.40	Vehicle Loader (Railway & Road Transport)
			8-81.50	Aircraft Loader
			8-81.60	Porter, Warehouse
			8-81.90	Longshoremen & Related Freight Handlers, Other LESS: those carrying hand baggage at railway or bus stations, airports or piers (see with Servant & Cleaner 223)
			8-99	Laborers N.E.C.

206	Other Manual Wkrs	Other Manual Workers	7-41.40	Maker & Repairman, Orthopaedic Appliance
			7-69.40	Sound-Recording-Equipment Operator
			7-69.50	Public-Address-Equipment Operator
			7-69.60	Cinema Projectionist
			7-82	Painters (except Construction & Maintenance)
			8-6	Packers, Labellers & Related Workers
			8-75	Material-Handling-Equipment Operators
			Part of 9-99.90	Those posting advertising posters & notices on walls & billboards
207	Craftsman	Craftsman N.E.C.	7-41.40	Maker & Repairman, Orthopaedic Appliances
			7-69.40	Sound-Recording-Equipment Operator
			7-69.50	Public-Address-Equipment Operator
			7-69.60	Cinema Projectionist
208	Other	Other Manual Workers N.E.C.	7-82	Painters (except Construction & Maintenance)
			8-61	Packers, Labellers & Related Workers
			8-75	Material-Handling-Equipment Operators
			Part of 9-99.90	Those pasting advertising posters & notices on walls & billboards
209	Service Wkrs	Service Workers	Part of 8-81.90	Those carrying hand baggage at railway or bus stations, airports or piers
			9	Service, Sport & Recreation Workers LESS: part of 9-01.90 those investigating fire sites to determine causes of fire & degree of personal or company liability--if any--or to appraise damage done; 9-6 Athletes, Sportsmen & Related Workers; 9-7 Photographers & Related Camera Operators; 9-8 Embalmers & Undertakers; 9-99.50 Bookmakers, Sport; part of 9-99.90 those rendering first aid to individuals, those pasting advertising posters & notices on walls & billboards

210	Protect Serv Wkrs	Protective Service Workers	9-0	Fire Fighters, Policemen, Guards & Related Workers LESS: part of 9-01.90 those investigating fire sites to determine cuase of fire & degree of personal or company liability--if any--or to appraise damage done
211	Policeman	Policeman	9-02 9-09.20 Part of 9-09.90	Policemen & Detectives Inquiry Agent, Private Those serving summonses on persons to be tried for crimes & misdemeanors or on those whose properties are to be foreclosed, & those maintaining order in courtrooms
212	Fire Fighter	Fire Fighter	9-01	Fire Fighters & Related Workers LESS: part of 9-01.90 those investigating fire sites to determine cause of fire & degree of personal or company liability--if any--or to appraise damage done (see Other Clerical Worker 066)
213	Guard & Watchman	Guard & Watchman	9-09	Guards & Related Workers N.E.C. LESS: 9-09.20 Inquiry Agent, Private (see Policeman 211); part of 9-09.90 those serving summonses on persons to be tried for crimes or misdemeanors or on those whose properties are to be foreclosed, those maintaining order in courtrooms (see Policeman 211); part of 9-09.90 those patrolling beaches & swimming pools to prevent accidents & to rescue bathers from drowning (see Other Protective Service Worker 214)
214	Other	Other Protective Service Worker	Part of 9-09.90	Those patrolling beaches & swimming pools to prevent accidents & to rescue bathers from drowning

215	Personal Serv Wkrs	Personal Service Workers	Part of 8-81.90	Those carrying hand baggage at railway or bus stations, airports or piers
			9-1	Housekeepers, Cooks, Maids & Related Workers
			9-2	Waiters, Bartenders & Related Workers
			9-3	Building Caretakers, Cleaners & Related Workers
			9-4	Barbers, Hairdressers, Beauticians & Related Workers LESS: 9-41.70 Bath Attendant
			9-5	Launderers, Dry Cleaners & Pressers
			Part of 9-99.90	Those performing non-medical & non-technical services for patients in hospitals, those performing personal services for users of lavatories & restrooms & keeping such places clean & tidy, those carrying the baggage of hotel guests & running errands for them, those cleaning & polishing shoes
216	Barb & Beautician	Barber & Beautician	9-41	Barbers, Hairdressers, Beauticians & Related Workers LESS: 9-41.70 Bath Attendant (see Other Service Workers 224)
217	Waiter & Bartender	Waiter & Bartender	9-21	Waiters, Bartenders & Related Workers LESS: part of 9-21.90 those removing used linen & dishes from table, those arranging tables & chairs, those washing & drying glasses & cleaning bars (see Servant & Cleaner 223)
218	Hostess & Steward	Hostess & Steward	9-11	Housekeepers, Housekeeping Stewards & Matrons
			9-19.70	Concierge (Hotel)
			9-19.80	Steward, Ship, Deck or Cabin
			9-19.85	Air Hostess
			Part of 9-19.90	Those taking care of needs & comfort of train or bus passengers

219	Laund & Dry Clean	Laundry Worker & Dry Cleaner	9-51	Launderers, Dry Cleaners & Pressers
220	Cook & Chef	Cook & Chef	9-12	Cooks
221	Hosp Attendant	Hospital Attendant	Part of 9-99.90	Those performing non-medical & non-technical services for patients in hospitals
222	Building Caretaker	Building Caretaker	9-31 9-32.40	Building Caretakers Chimney Sweep
223	Servant, Cleaner	Servant & Cleaner	Part of 8-81.90	Those carrying hand baggage at railway or bus stations, airports or piers
			9-19.20	Maid (except Private Service)
			9-19.30	Maid (Private Service)
			9-19.40	Maid (Personal)
			9-19.50	Valet (Private Service)
			9-19.60	Nursemaid
			Part of 9-19.90	Those attending children in showers and restrooms of schools & institutions; those rendering valet services to guests & employees of a hotel; those performing various tasks in preparation of food, such as cleaning & peeling vegetables
			Part of 9-21.90	Those removing used linen & dishes from tables & chairs, those arranging tables & chairs, those washing & drying glasses & cleaning bars
			9-32	Charworkers, Cleaners & Related Workers LESS: 9-32.40 Chimney Sweep (see Building Caretaker 222)
			Part of 9-99.90	Those performing personal services for users of lavatories & restrooms & keeping such places clean & tidy, those carrying the baggage of hotel guests & running errands for them, those cleaning & polishing shoes

224 Other Service Wkrs	Other Service Workers	9-41.70 Bath Attendant 9-99.20 Companion 9-99.30 Mannequin 9-99.40 Wardrobe Mistress, Stage & Studio 9-99.60 Croupier 9-99.90 Service, Sport, & Recreation Workers N.E.C., Other LESS: those rendering first aid to individuals (see Other Nurse 029); those performing non-medical & non-technical services for patients in hospitals (see Hospital Attendant 221); those performing personal services for users of lavatories & restrooms & keeping such places clean & tidy (see Servant & Cleaner 223); those carrying the baggage of hotel guests & running errands for them (see Servant & Cleaner 223); those cleaning & polishing shoes (see Servant & Cleaner 223); those pasting advertising posters & notices on walls & billboards (see Other Manual Workers N.E.C. 208)
225 Other Wkrs	Other Workers Not Elsewhere Classified	

APPENDIX E

OCCUPATIONAL NOTES

The purpose of these Notes is to show how we classified the occupational titles of the original data obtained from the countries in our study. The Occupational Notes have not been included in Volume I because of their bulk, but will be furnished as special inserts to users of our tables.